



AMERICAN BEE JOURNAL

OCTOBER, 1921

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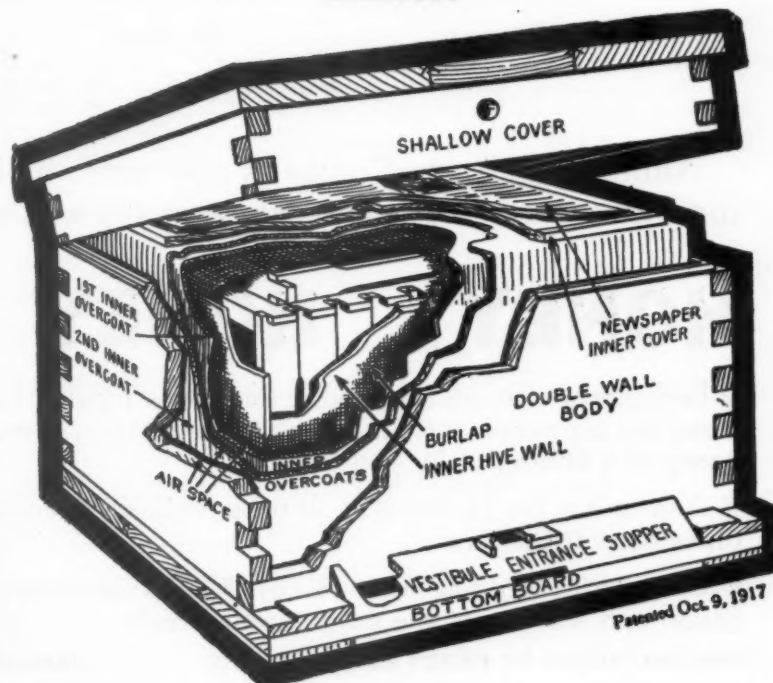
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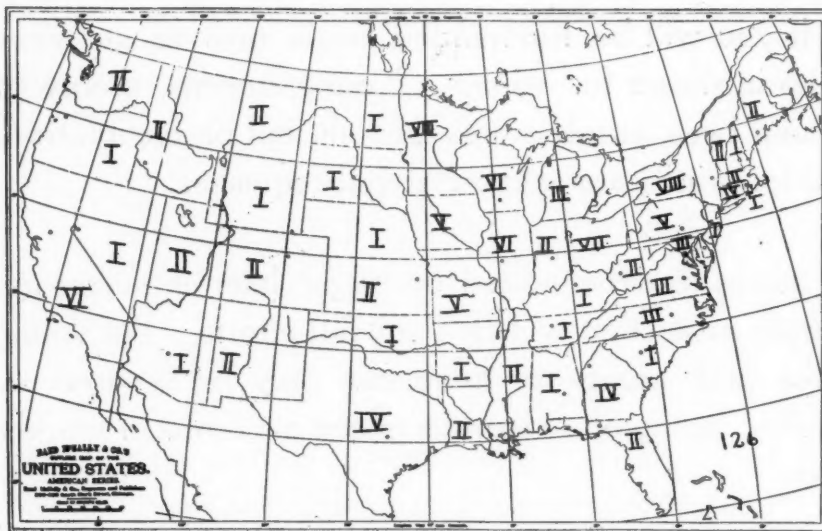
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VOL. LXI—NO. 10

HAMILTON, ILL., OCTOBER, 1921

MONTHLY, \$1.50 A YEAR

THE COTTON PLANT AS A SOURCE OF NECTAR

Notes on the Behavior of the Plant in the Lone Star State, where it is an Important Field Crop—By H. B. Parks

THE relationship between the honeybee and the cotton plant has become a matter of peculiar interest, as in many places honey is a valuable and about the only companion crop of cotton. In the southeastern part of the United States, cotton is looked upon as being a poor honey plant, while in Texas, parts of Oklahoma, Arkansas and the Imperial Valley of California, it is one of the best producers. In these locations, however, it is only in restricted areas that the yield of honey is large. The governing factor of nectar production in the cotton plant seems to be a black, rich soil and a relatively permanent water supply. In many parts of the cotton-producing section, the bee is looked upon as a great aid in the cotton industry, as it is stated that through pollination bees increase the yield about 33 per cent. In other sections, especially where the raising of pure seed is attempted, cotton farmers claim that the honeybee is a nuisance, as it causes the cotton to mix, producing seed not suitable for sale as pedigreed seed.

The plant belongs to a group which is well supplied with nectaries, but, with the exception of cotton, none are noted as honey producers. Cotton is found native in almost every tropical or semi-tropical land, but it seems that the American developed plant is the best yielder of nectar. In Texas, cotton is raised in almost every county. In the counties included within the large area on the map, cotton yields a greater or less supply of nectar. The smaller area outlined on the map includes what is known as the black land, and only within this area is cotton generally a heavy producer of nectar. A study of these soils shows that cotton is commonly nectar-bearing only on soils which have a high per cent of lime and organic matter, and the secretion of nectar is further governed by the permanent supply of

moisture. The very fact that there are small, isolated spots where cotton is heavily nectar-bearing substantiates this statement, as these spots which lie outside of the regular black land belt have a soil which answers the above requirement. In this discussion the cotton upon which the observations were made is the standard cotton of the South, which has a white flower that turns red in dying. While the sea-island or yellow-flowered cotton is grown to some extent, it is not regarded as a honey plant in Texas.

As the interest in this question is

two-fold, there are naturally two questions that come up for discussion. The first is the amount and dependability of the nectar flow and the second is the value of honeybees to the cotton plant in producing cross pollination. Some explanation is necessary before this question can rightly be discussed. A nectary is a gland on a plant, secreting a thin sugar solution. According to the location, these glands are known as floral and extra-floral nectaries. The former are located within the flower and the latter at some other place on the



The cotton area of Texas. It is most important in the small area, but produces some nectar within the borders of the larger area.

plant. It is thought that the purpose of these glands is to attract insects to the flowers so that cross fertilization may be effected. Both kinds of nectaries occur in the cotton plant. Extra-floral nectaries are found on the mid ribs of the leaves. These glands are diamond-shaped pits located about one-sixth of the distance between the stem and the top of the leaf. Other nectaries, while very closely connected with the flowers, are not true flower nectaries. The flower is enclosed in the ring or involucre of



Fig. 1.—Flower of cotton, showing nectary on side of calyx.

three bracts and rarely a second ring of bracts. At the base of each bract is a large oval gland having an area of about two square millimeters (fig. No. 1). These glands are very conspicuous and often highly colored. This group is popularly known as the "eyes." Within the involucre, a true tubular calyx encloses the flower. At the base of this tube and at the openings between the involucre bracts are located three other nectaries (fig. No. 2). These are slightly smaller than the first ring. A row of nectaries is located on the inside of the calyx at the base of the petals. The petals are so arranged that they overlap. These nectaries are indicated by tufts of fine plant hair, located near the base of the petals. On account of the overlap of the petals, the surplus nectar from the calyx glands very often is found within these clusters of hairs. This has given rise to the opinion that the edges of the petals also have nectar-bearing glands. In observing the bees working upon the cotton blossoms for nectar, it appears that they more often insert their tongues between the calyx and the petals to reach this nectar than force their tongues between the petals. Thus it appears that all of the nectar-bearing glands of cotton are, in a way, extra-floral nectaries. In no instance were glands found at the base of the stamen column, which in most plants is the location of the true flower nectaries. In several varieties of cotton, however, purple areas exist at the base of the petals. These areas are similar in shape and location to smaller areas called pathfinders, which exist in other flowers and which indicate the location of the nectary. From the observation given it appears as

if the nectaries were arranged to attract the insects from and not into the flower.

Dr. Wm. Trelease, in "Nectar and Some of Its Uses," in Comstock's reports on insects, suggests that this species of cotton has lost its true floral nectaries since its domestication and that, in its wild state, the many extra-floral nectaries were of advantage in attracting insects to the plant, and thus help in pollination. It is learned that plants possessing nectaries, when grown in soil having a normal water content and a high per cent of available plant food, will, during periods when the surrounding air has a high water content, secrete more nectar than under any other condition. As these limitations are descriptive of the area in Texas where cotton is a heavy nectar producer, the above statement is accepted, not as stating the cause of, but as giving the conditions governing heavy secretion.

One of the things greatly desired by the student of floral ecology is some means by which nectar secretion can be detected easily and measured accurately. In the cotton plant the glands are so large they can be easily measured.

Area of three glands on involucre	-----6 sq. mm.
Area of three glands on calyx	-----4.5 sq. mm.
Area of three glands on petals	-----5 sq. mm.
Total	-----15.5 sq. mm.

A normal plant will average 5 blooms per day,	
5x15.5	-----77.5 sq. mm.
Total area of gland on leaf 5	sq. mm.
A normal plant will average 100 leaves per day, 100	
x.5	-----127.5 sq. mm.

During the blooming period, from June 14 to October 15, (125 days) a surface of (125x127.5) 15,937.5 sq. mm. is exposed. As some plants do not produce flowers or leaves on which all the glands are present and as rainy days prohibit working, this area has been reduced to 100 sq. centimeters. The secreting area of 100 square centimeters is about 15 square inches, or a square about 4 inches on a side. These glands have a total depth of 3 millimeters. The surface is not smooth, but is covered with fine hair, so that it would require a considerable depth of accumulated nectar before the liquid surface, such as is often seen in nectaries would be produced. It requires 5 grams of nectar to produce a continuous layer from a surface 10 centimeters square. Thus a single cotton plant would have on its surface, if the total secreting surface were exposed at one time, 5 grams of nectar. Whether or not the secretion is increased by part of it being removed by the bees is not known. The weight of the raw nectar evaporated into honey of 12 lbs. standard would be 2.5 grams. Thus the bees will have to carry 2½ gallons of nectar to the hive to obtain one gallon of honey. Analysis shows that fresh nectar contains from 17.66 per cent of solid matter, up to 82 per cent,

which is the approximate per cent of the solid matter in old honey. This is another and very important explanation as to why some plants are much better honey producers than others. Bees working nectar containing 17.66 per cent would have to collect five times as much material as when collecting 82 per cent nectar, not to mention the time employed in reducing it to the consistency of ripe honey. A peculiar point that arises here is the relationship between nectar with a high water content, cane sugar and fermentation. From analysis at hand, all honeys from watery nectar are high in per cent in cane sugar, and even though they have the same specific gravity as other honeys, are apt to ferment. Cotton nectar does not have a high water content and is of medium thickness. Thus bees will have to gather about twice as much nectar as the resulting amount of honey.

From the data presented above, the honey from a single average plant should be about one-half the weight of the nectar, or 2½ grains. This weight multiplied by 2,500, the average number of plants per acre, gives 6.25 kilos, or 13.7 pounds per acre. While this is wild speculation, it is based on sufficient facts to show why the cotton plant is one of the foremost honey producers. It is further believed, from observations, that the secretion of nectar far exceeds that. The amount of nectar in a certain nectary did not seem to be reduced to any great extent by the working of bees upon it and it seems highly probable that, up to a certain limit, the more the bees work the cotton plant the greater the secretion. Observation made by beekeepers living in the cotton section would lead to the belief that the average production of



Fig. 2.—Nectaries under cotton square. From these the honey is collected.

honey to an acre of cotton is about 28 pounds.

While cotton blooms continuously from the middle of June until frost, and the nectaries secrete throughout this time, it has two distinctive blooming periods during which large nectar flows are noticeable. The first occurs when the plant reaches a height of about 2 feet and before the boll- weevil commences to be destructive to

the fruits. During this period the greater part of the cotton honey is stored. In some cases and some years the boll-weevil is so destructive that the bolls fall before the "eyes" secrete nectar, and therefore cotton honey is almost a failure. The second period occurs in September or October when, because of the hot, dry weather, the boll-weevil has ceased to work and the cotton puts on what is known as the "top crop" and reaches the "flower garden stage." It is during this period that some extremely heavy yields of pure cotton honey have been stored.

To men who are interested in cotton as well as in bees, the discussion of the second question is also of interest.

The importance of the honeybee as a pollinizer of cotton is also based on the location of the nectaries. Mr. A. Allard, of the United States Department of Agriculture, states that of the number of bees visiting the cotton plant, 8 per cent were honeybees. Of the bees which visit the flowers, one-half were honeybees. He does not describe their visits, but it is safe to say that they were not working the flowers for pollen, but for the nectar which was contained in the tufts of hairs on the petals. Trelease states that more of the bees work only on the proximal ends of the petals of the flowers. Plant breeders state that the cotton plant is self fertilized and that the flowers that open between 7 and 8 o'clock are fertilized by 8:30 or 9 o'clock. In other words, self-fertilization takes place in about one hour after the opening of the flower. It was found here that the cotton flowers open near 1 o'clock, a. m., but that the bees did not commence to visit the plant until 8 o'clock. In observing the cotton blossoms, it was seen that very few honeybees did enter the flower, but that many bumblebees, melissodes and other solitary bees, some beetles and moths, did work inside of the corolla. If one



Fig. 3.—Nectary on mid rib of leaf. Some honey is gathered here also.

will look at the cotton flower (fig. 4) it can be readily seen that the bee could collect nectar all the way around the stamen column and never come in contact with it. Such bees would, however, have much pollen ad-

hering to their backs. From the open structure of the flowers, it will be seen that a bee would come in contact with the stigmas only when it entered a flower which was partly open, and then it would only touch its under sides and not the back, where the cotton pollen is carried. Bumblebees and other large hymenoptera, on entering the open flowers, touch both stigmas and stamens and thus easily effect pollination. It was further found that cotton plants screened in so that honeybees could not have access to the flowers were perfectly pollinated either by the wind or by the numerous small bees and flies which worked within the cage. As self-fertilization takes place to a high degree in cotton and as honeybees were seen to collect pollen from the cotton blossoms only on rare occasions, it appears that, in collecting nectar, honeybees do not come into close contact with the stamens and pistils. It seems then that this insect is little responsible for cross-pollination in cotton.

The cotton honey flow outside of the black land area is so uncertain that beekeepers do not count upon it except as a chance addition to the general honey crop, but in the black land the flow is very dependable. The flow commences about the middle of June and continues periodically until the cotton plants are killed by frost. The fact that the honey is very light amber and of fine quality makes it an ideal flow to run for bulk comb honey and one is not far wrong in stating that approximately one-half of this class of honey from Texas is from the cotton plant.

The fact that cotton blooms late in the summer and that, in cotton locations, there is seldom much of an early honey flow, has given rise to the combless package business among the beekeepers of this section. These men allow their bees to go into winter quarters with very heavy stores and in early spring stimulate their colonies by wholesale feeding until they have a very heavy force of bees at the time when the northern markets are demanding combless packages. This force of bees is shipped north and the beekeeper, by manipulating his hives, raises a second brood in time to collect the first cotton flow. This heavy production of bees by manipulation causes the queens to wear out very rapidly and annual requeening is very commonly practiced. The majority of the combless package sellers of Texas are residents of the black land district.

In conclusion, it must be said that the raising of honey, queens and combless packages, is a very highly specialized branch of the bee industry, within the cotton area, and that it requires a professional beekeeper, who has studied very minutely the problems mentioned above, to make a success of beekeeping in this area; but along the edges of this area, where the bees have an early flow from some other plant, the beekeepers produce a crop of honey with less effort than anywhere else in the State.

BEE INCIDENT FROM MANCHESTER

The date of the visit of the Prince of Wales to Manchester coincided with the 25th birthday of the Manchester and District Beekeepers' Association—an association formed by a few in the district of Manchester, who had an interest in common—the study of the honeybee.

On the date mentioned a member was traveling through Manchester with a light wooden box containing combs and bees to the Corrington

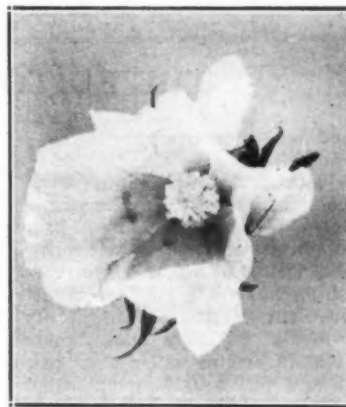


Fig. 4.—There are no exposed nectaries within the cotton flower.

Farm, with the object of demonstrating queen rearing and breeding, but the procession and dense crowds held up all pedestrians. So, waiting to see the Prince, our member placed the box beside him on the pavement and gave all attention to the moving procession and delighted throng.

His patriotic attention was, however, soon distracted by a sharp crack and a truly feminine squeal which escaped from a lady who had attempted to use the fragile box as a point of vantage from which to secure a good view of the scene.

The lady's leg had dropped among the bees, much to their annoyance and disgust. Their attention did not allow the victim to stay and apologize for the damage done to the box and contents, but she was last observed making a bee line for other parts in a cloud of dust.

The owner of the bees subdued his excited insects and treated the incident as a huge joke. Did the lady?—(R. A. C. in British Bee Journal).

INTRODUCING QUEENS

By L. G. Windsor

When your new queen is received, go to the colony to which she is to be introduced, take a queen cage with you and find the queen, put her in the cage with a few bees. Take the cage in the house and leave it there 30 minutes, then take the queen out and kill, and turn the bees loose. Put your new queen and her escorts in this new cage, leave her there 30 minutes, then introduce by the cage method.

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THE EDITORS' VIEWPOINTS

Mixed Infection in Brood Diseases

A reprint from the Journal of Economic Entomology, in the shape of a bulletin, is on our desk. It is by Dr. Sturtevant, who works with Dr. Phillips at the Bureau of Entomology of Washington.

Dr. Sturtevant is undoubtedly correct when he says that "mixed or double infection is more probable than had previously been supposed." Double infection, in Europe as well as in this country, is responsible for many errors made in diagnosis as well as in treatment. Probably the error of Cheshire, in describing the symptoms of one of the brood diseases, while giving the proper treatment for the other, was due to double infection. The reprint in question mentions only 38 cases of double infection, recognized at headquarters, among 7,568 different samples, received from 1911 to 1920, and from 13 different States. Illinois is not among them; yet we recall several instances where the statement made by the Illinois beekeeper could be explained only by the existence of mixed infection of European and American foulbrood.

As Dr. Sturtevant says: "Since the requirements of the treatment of the two diseases are so entirely different, the necessity for correct diagnosis becomes important." Indeed the matter is of great importance, and it is so much more necessary that samples of diseased brood should be forwarded to headquarters at Washington, whenever the diagnosis is not positive.

An International Congress

The second International Congress of Comparative Pathology is to meet in Rome, September 20, 1922, and among the 21 questions to be discussed, the diseases of the honeybees are listed, with our editor as the expected author of the opening address on this subject.

The questions to be brought to the attention of the scientists at this Congress embrace all sorts of diseases of man and animals, from cancer in human beings to cattle, poultry and silk worm diseases. It also includes bacteriology and parasites in the vegetable kingdom; manges, phylloxera, etc.

The announcements are forwarded by Dr. E. Perroncito, 40 Corso Valentino, Turin Italy, who is one of the active officials in charge of this Congress. Dr. Perroncito is a beekeeper of note in Italy.

Sweet Clover and Lime in Illinois

"When the lime and sweet clover are properly used on such soil as the blow sand lands in Henderson County, the crop yield may easily be doubled," says Professor H. J. Snider, of the University of Illinois. His statement is of general interest because of the vast stretches of sand land in this State, particularly along the Mississippi, Illinois, Wabash and other rivers, and in other States as well.

In 1914 the University of Illinois began extensive experiments on a 20-acre tract of blow sand in Henderson County, to determine the fertility needs of this type of farm land. Results at the end of six years show that an application of four tons of limestone per acre is the first essential to reclaiming the land. Limestone, however, is no less essential than sweet clover, grown as a green manure crop.

"Alfalfa does exceedingly well on this land when once it is properly started," added Professor Snider. "On lime land the yields have been as high as 4½ tons of hay per acre."

The University found that rye does well on this type of land, also. In 1920, untreated land yielded 13 bushels of rye, while land which had received lime and sweet clover treatment yielded 29 bushels.

Law Concerning Honey

The French Congress has followed the example of the United States, in its pure food law, by adopting a decree which forbids the use of the word "honey" for anything but pure bees' honey. That is right, "honey" is an attractive word and should be retained to denominate only the product of the bees gathered from the flowers. Otherwise, we would be permitting it to be "deflowered."

Undesirable Publicity

There is entirely too much general publicity given to the subject of bee diseases in the newspapers. Owing to the fact that the public does not

understand the nature of bee diseases or their treatment, the effect of much of this publicity is to create a prejudice against the use of honey. A clipping has recently reached the editor's desk which makes the statement that "a campaign is on to clean up the bee diseases that contaminate honey." Such a statement can serve only to make the readers who are unfamiliar with honey afraid to buy it, for no one wants to eat contaminated honey. If all the facts could be clearly stated, so that it would be understood that honey is not in the least injured for human food by the presence of bee diseases, perhaps no harm would be done.

After reading a batch of several hundred such clippings, many of which contain absurd statements, one cannot but feel that much of the publicity concerning bee diseases is having a bad effect on the market by frightening the consumer.

The following is another sample, from the New York Tribune of July 24:

"The purposes of the census is to have on hand data to enable the agriculturists to stamp out a disease that contaminates honey and is liable to be given to persons addicted to the use of that product."

In this case the direct statement is made that the malady is likely to be contracted by persons using the honey. In most cases such statements do not appear, but the reader is likely to draw such an inference from the manner in which the information is given.

A Correction

In our August issue, in the list of subscribers to the Dr. Miller Memorial Fund, we gave credit to Chas. F. Hoser for a contribution of \$25. This should properly have been credited to the Montgomery County, Penna., Beekeepers' Association, of which Mr. Hoser is secretary.

Beekeeping Tenth in Wisconsin

Beekeeping now ranks tenth in importance of agricultural industries in Wisconsin, according to the census. It is the opinion of Prof. H. F. Wilson, in charge of bee culture at the State University at Madison, that it will soon outrank some of the other pursuits and become fifth or sixth in importance.

Bee Poison as a Medicine

Some of the magazines are ridiculing the idea of the poison of the bee being of any benefit in curing rheumatism. It has been tried and failed, they say. True, in many instances. But rheumatism may be caused by a number of different conditions. Is it not possible that, although some cases of rheumatism are entirely refractory to such treatment, others are conquered by it? Too many cases have been quoted of successful treatment to permit the absolute condemnation of this remedy. Read the article on page 358 concerning the sting cure.

NORTH AND SOUTH AT MEETINGS

On August 14, the editor started for the Wisconsin bee chautauqua, which was to be held at Chippewa Falls during that week. His trip was by the way of St. Paul. At the arrival in that city on Monday morning, he found Professor Francis Jager with Mr. P. J. Doll awaiting him at the station, and he was entertained in the way which makes Father Jager so popular among our beekeepers. A visit at the apiary grounds of the State University was followed with a banquet where ten beekeepers were present, including the writer. Then an auto trip was made to the apiary of Professor Jager, situated beyond Lake Minnetonka. There we had the pleasure of seeing colonies of imported Carniolan bees. One of these was opened without any smoke whatever, frames lifted, the bees shaken off, without a single bee showing anger. Those pure Carniolans are certainly peaceable. Were it not for the difficulty of keeping them pure and the almost impossibility of ascertaining a small amount of mixture of other races, they would certainly be desirable, for their gentleness at least. The Italians may equal them, but do not excel them in this.

The field meet, at Chippewa Falls, was unsurpassed for the location of it, at any meeting anywhere. It was held in an open auditorium in the park adjoining the city, which is located in a very picturesque situation.

A lengthy discussion was held concerning the Wisconsin laws on honey and the grading of honey. Mr. C. D. Adams, of the Wisconsin Division of Markets, brought attention to the fact that much apparently ripe honey weighs under 12 pounds to the gallon, varying from 11 pounds 12 ounces to 11 pounds 14 ounces. If this is correct, it might be necessary to lower the legal minimum weight to a trifle less than 12 pounds. Some honey may be in perfectly good condition and keep well at a little less than 12 pounds to the gallon. Many people judge of the density of honey by its greater or less fluidity when a glass jar of it is inverted. But attention was called to the fact that in hot weather, the density is apparently much lowered and the honey appears thinner.

A. C. F. Bartz, one of the remaining beekeepers of the "old guard," gave an interesting talk on the industry in general, calling attention to the fact that no other industry of farming can boast of producing two crops on one plant; on clover or alfalfa hay and honey; honey and fruit on peach trees or apple trees, at the same time, making beekeeping a desirable industry.

A beekeeper showed a steam uncapping knife of his own invention, in which the steam returned to the kettle instead of condensing and its water mixing with the extracted honey.

The annual or "Hubam" sweet clover was much praised by Mr. E. R. Root, who had just visited some of the most extensive producers of this

clover. It is said to produce stems and bloom very quickly, growing sometimes at the rate of a foot per week, reaching in 3 months a growth which is not attained by the biennial in less than 21 months. This clover may be distinguished from the biennial, while it is growing, by the fact that the biennial shows where the stem of the previous year has died back during the winter, while the annual has a perfectly straight stem. So any beekeeper may be able to distinguish one from the other by this sign.

Dr. E. F. Phillips, of Washington, gave a very interesting talk on the causes of honey yield, giving cool nights and warm days as the ideal weather for honey. He also stated that "the slower the yield of honey in a plant, the darker the comparative color of its honey, because of the greater amount of gum contained in slowly-produced flows of nectar."

The C. C. Miller Memorial Fund received a boost at the Wisconsin meeting. We had just received information of a \$100 subscription to that fund by the beekeepers of one of our smallest States, Connecticut, at the Storrs meeting, under the urging of Allen Latham and Dr. Phillips. Dr. Phillips also spoke at the Wisconsin meeting, with much warmth, concerning the debt that the average beekeeper owes to Dr. Miller, the world over, since few, if any, of us can say that they did not learn anything from him. In far away countries they are subscribing to this fund, which should reach a sufficient sum to return at least \$100 in a perpetual income for a Beekeeping Scholarship or Beekeepers' Library, somewhere in his native country, the United States. It is evidently going to come, for the beekeepers are awakening.

From Chippewa Falls, on the 18th, the editor went to Carbondale, Ill., a jump of 7 degrees of latitude, or over 600 miles from north to south. Needless to say that the same clothes were unsuitable, for while it was cool and pleasant in northern Wisconsin, it was hot in southern Illinois.

The meeting at Carbondale, gotten up by some enthusiastic members of the Southern Illinois Beekeepers Association, was well attended, but mainly by beginners. We must commend the efforts of Messrs. F. M. Caldwell and J. R. Wooldridge, the President and Secretary of that association, for their effective work. If each association of beekeepers had such live officers, there would be much more interest taken in beekeeping and methods of honey selling.

Michigan Work

The practice of publishing an occasional "Beekeepers' Letter," followed by the Extension Division at East Lansing, begun by B. F. Kindig, is still kept up. The last letter was sent out by R. H. Kelty, the Secretary of the State Association. It contains valuable information. Similar letters should be published by different States, for the bee magazines cannot enter into details for each State, in the way that may be followed by the State officials.

In addition to the last "Letter," volume 3, No. 8, Mr. Kelty has published a Bulletin of 16 pages, No. 107, on "Diseases of Bees in Michigan." It is replete with needed information, for those who have not read the official bulletins from Washington, or the late editions of our text books.

Every year, something new is learned, and the only way to keep informed is to read up.

Death of F. W. L. Sladen

It is with deep regret that we announce the death, by drowning, of this gentleman, on September 10. It was at Duck Island, which we understand is in Lake Huron, where he was conducting some special research work in beekeeping. Mr. Sladen was Dominion Apiarist. We will give further mention of his work.

Food Waste in Feeding

Professor Wilson, of Wisconsin, found that for every 30 pounds of syrup fed to the bees in the fall, less than 18 pounds was stored by the bees. The balance went into brood-rearing and wax producing. We know that in other seasons still more is consumed for those two purposes. Huber, when he fed his bees, in Switzerland, said that the loss was so great that it did not pay to feed at one time more than they could consume each day. This was not practical. But Huber was a scientist, a student, an experimenter, and not a practical honey producer.

Honey From Shoestring Vine

C. H. Wiley, of Harrisburg, Ill., reports a large amount of honey gathered from this plant, also called blue-vine (*Gonolobus laevis*). He reports two kinds, one with a white blossom, the other with a bluish blossom. It is a very noxious weed, which weighs down the corn stalks and cannot be easily eradicated. It is fully described by Pellett in "American Honey Plants."

Large Hives; Large Broodchambers

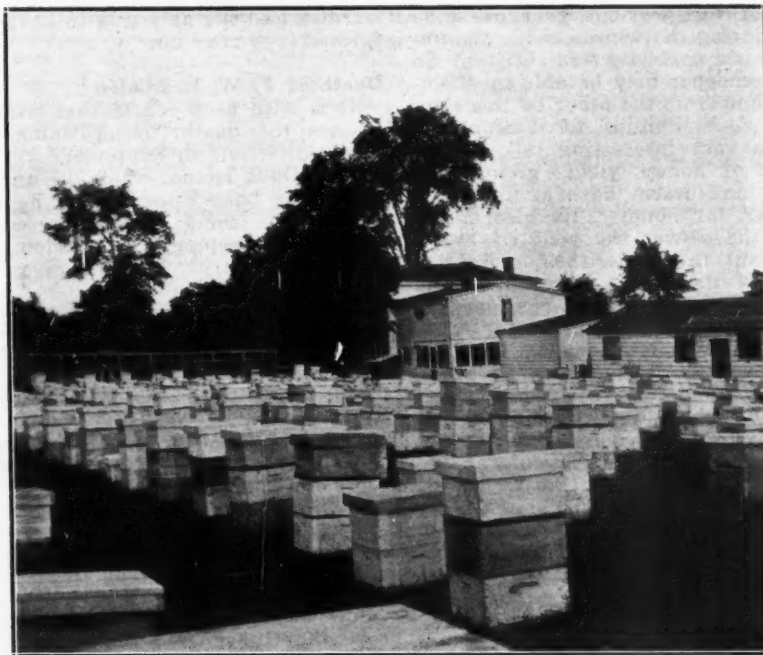
The large hive question looms up everywhere. Professor Jager, of the Minnesota State Agricultural Farm, affirms that within 15 years the shallow frame will have lost its popularity and become obsolete. But the standard Langstroth frame is too well established, in our opinion, to take a back seat so soon, if ever it does.

The Mystery of the Bees

"Le Mystere des Abeilles." Here is a work very similar to that of Maeterlink "The Life of the Bee," by another writer in the French language, Eugene Evrard. As poetical as Maeterlink's book, this work has the advantage of being also practical and almost strictly correct in its descriptions. It is worth reading, and we recommend it to those of our friends who are masters of the French language. The descriptions of the "twenty different voices of the bees, which describe their desires or their lust, their hopes or their troubles, their wisdom or their ardor" are worthy of the pen of Huber.

BEEKEEPING IN NEW YORK

Impressions of the Empire State After a Journey of Hundreds of Miles Through Its Principal Beekeeping Territory—By Frank C. Pellett



Big apiaries are the rule in the buckwheat region. R. V. Cox has 460 colonies in this yard.

It is probably safe to say that New York has more commercial honey producers than any equal area on the American continent. The census shows that several States contain more bees within their borders, but New York has more beekeepers who number their colonies by hundreds.

There are some important advantages enjoyed by the beekeepers in this region, the greatest of which is the world's best market. Within a small area of a few hundred square miles, is concentrated a population greater than is to be found in several whole States in the Mississippi Valley or the Far West. The western beekeeper finds that the price of his product is likely to be fixed by the price at which honey is selling in New York. From his receipts he must deduct a high freight rate sufficient to carry his crop to the eastern market. The New Yorker sells at his door and pockets that much additional change. Again, there are few places within our borders where it is possible to keep as many bees in one yard as in the buckwheat region of New York. Our cover page shows the Alexander apiary, at Delanson, which has long been famous because as high as 700 colonies have been kept in the one location. The writer has often heard the opinion expressed that beekeepers in this region would secure much larger crops with smaller yards. However, those who have kept bees in the buckwheat region for many years have not found this to be the case. R. V. Cox, of Sloansville,

has 460 colonies in one yard. Mr. Cox tried dividing his bees into smaller yards, but found that he did not secure more than 10 per cent more honey than when he kept them all in one place. This small increase in production was not sufficient to pay the increased cost of operation, so he has since kept them in one yard.

E. W. Alexander wrote in 1906 that he considered a place which would furnish a harvest for 35 days sufficient for a colony of Italian bees to store 100 pounds of surplus honey, a good location. He wrote also that he knew that his location furnished just as large crops per colony with 750 colonies in the one yard as it ever did with a less number. However, Alexander fed freely in early spring to insure brood rearing sufficient to build up his colonies. Buckwheat was and is now the principal source of surplus in this region. To support such large apiaries a location must not only have an abundance of plants which furnish the surplus yields, but there must also be a great variety of sources of nectar and pollen to support the bees during the remainder of the season. There are many places which would support large apiaries during the principal flows, lacking in natural pollen for much of the season before and after this flow. In such locations only as many colonies can be kept as can find support during the rest of the time.

Buckwheat yields best with cool nights, followed by bright days, with little wind. It requires a humid climate and is not important as a source of nectar in regions where the atmosphere is dry. It is possible, however, that altitude and temperature may be the important factors, since it is reported as yielding in northern Nebraska, where the altitude is above 1,800 feet, even though the air is dry.

Other Sources of Honey

The buckwheat region of New York is more widely known than other sections because the large apiaries give it a peculiar distinction. However, only a comparatively small portion of New York is in this region. White and al-sike clover probably furnish the greater part of the surplus honey going to market from this State. The



Purple Loosestrife grows higher than a man's head in the wet lands along the Hudson River.

past season a number of beekeepers reported surplus honey from alfalfa. Generally speaking, alfalfa seldom yields nectar to any extent east of the Missouri River. It probably is not often important to the New York honey producer.

Basswood is still important in a few places, although the cutting of the trees is rapidly removing basswood from this section, as elsewhere. The large orchards provide immense areas of fruit bloom and a few beekeepers are sufficiently expert to get their bees through the winter strong enough to store surplus from fruit bloom when the weather is favorable. Forage from the fruit trees is sufficiently plentiful to provide an abundance of honey, but there is nothing the beekeeper can do to make the sun shine during the fitful weather of early spring. Too often there will be only a few bright days in which the bees can make the most of the available supply. In most cases fruit bloom and dandelion are utilized to build up the colonies for later flows.

Sweet clover is becoming of more importance in the east every year and, while it apparently does not yield as heavily as in the west, it is valuable wherever grown.

Goldenrod and asters follow the buckwheat flow and furnish ideal conditions for late brood-rearing in preparation for winter. At times, however, the quality of this late honey is such that the beekeepers find it advantageous to feed some sugar syrup for winter stores.

Some Special Sources

There are many plants important in limited areas of New York which are little known outside that State. Among these may be mentioned wild thyme, which was mentioned in several numbers of this Journal this year. J. B. Merwin, at Prattville, lives in a region where thyme is the principal source of surplus. In 25 years he has never had an entire failure from

thyme, and he has had as high as 125 pounds of surplus per colony from this source. Thyme is mostly confined to Delaware and surrounding counties.

Purple loosestrife is another plant not often found outside of New York. It is a vigorous plant, reaching a height of 6 feet or more, and grows only in wet places not suited for agricultural purposes. It is common up and down the Hudson River and the backwaters and inlets of that stream. It is also common in parts of the Mohawk Valley and westward across the State. It blooms in midsummer and

the honey is dark and of inferior quality. It is commonly known as rebel-weed.

In the northern part of the State, in the Adirondack region, there are some fireweed locations. On Long Island, Clethra is found in abundance.

The Conventions

New York has numerous organizations of beekeepers and the writer greatly enjoyed attending about a dozen of these meetings. Entirely too much space would be required to give a detailed account of them. The attendance was surprisingly good, considering the number held. Even the local meetings which happened to fall on rainy days had some lively discussions and good turnouts. The writer made the round with George H. Rea, the beekeeping specialist for the college at Ithaca. Rea is a real beekeeper who has had years of practical experience in the apiary as well as years of experience in inspection work in Pennsylvania.

If one is to judge from the number of complimentary things the writer heard said of Rea behind his back and the few criticisms that were spoken, his services are appreciated by the rank and file of the big honey producers of his State. A picture of Mr. and Mrs. Rea, at their home in Ithaca, is shown herewith.

After the first meeting we were joined by A. E. Lundie, whose home is in far South Africa. Mr. Lundie is making an investigation of beekeeping conditions in this country for his government, and will be in this country for several months. He is a splendid traveling companion and we were especially happy in his company. How little conditions in South Africa are understood in this country is best illustrated by the fact that many peo-



Left to right, A. E. Lundie, Otto Hupfel and G. H. Rea.



Prof. and Mrs. Rea, and their Ithaca home.

ple apparently expected to see a black man when Mr. Lundie appeared. His picture is shown, together with G. H. Rea and Otto Hupfel. Mr. Hupfel is a New York business man who has a delightful farm home, not far from the Hudson, and who is an enthusiastic beekeeper.

Local Selling

To a man from the west the number of roadside markets is a constant surprise. New York has some wonderful roads, and farmers living beside them establish markets of their own for the purpose of selling to tourists beside them establish markets of their roadside markets, where corn, tomatoes, fruit and other seasonable farm products were sold. Many city people driving through are very glad of a chance to buy fresh produce direct from the farm. Thousands of pounds of honey are disposed of in this way. Many western farmers will do well to give this roadside selling a trial. Adams and Myers, of Ransomville, N. Y., who are big fruit growers as well as beekeepers, stated to the writer that on one occasion they sold more than \$500 worth of fruit and honey at the farm in one day.

UNEDITED LETTERS OF HUBER

Introduction

(Continued from September)
(Translated from the French by C. P. Dadant).

Here is a resume of the discoveries of Huber, by the noted A. P. De Candolle:

"The origin of beeswax was then a much discussed point of the history of bees, by naturalists: some of them had said, but without sufficient proof, that they made it of honey; Huber, who had successfully unraveled the origin of propolis, confirmed that opinion concerning beeswax through numerous tests and showed especially, with the help of Burnens, how it oozed from the rings of the abdomen, in the shape of scales. He made extensive experiments to ascertain how the bees prepare it for their combs. He followed, step by step, all the constructions of those marvelous hives in which the bees seem to solve the most subtle problems of geometry; he assigned the role which each class of

bees plays in this work, and followed their labor from the rudiment of the first cells to the complete perfecting of the combs. He made known the ravages caused by the sphinx atropos (death's head moth) in the hives which it enters; he even tried to unravel the history of the senses of bees, and particularly to seek the seat of the sense of smell, the existence of which is demonstrated upon the entire natural history of insects, while their structure has not yet permitted to locate it with certainty. Lastly, he made interesting experiments on the breathing of bees; he proved by several experiments that those insects need oxygen just as do other animals. But how can air be renewed and retain its purity in a hive closed everywhere, except at a small entrance, with a sort of putty? This problem required all the sagacity of our observer, and he came to recognize that the bees, by a peculiar motion of their wings, set the air in motion so as to secure its renewal; after having taken note of this, he even proved his statement by imitating this ventilation through artificial means.

These experiments on the breathing of bees required some analyses of the air of the beehives, and this requirement caused Huber to come in contact with Senebier, who was making analogous researches upon plants. Among the means that Huber had thought out to ascertain the quality of the air in the hives was that of germinating some seeds within the hive, basing himself upon the idea that seeds will not germinate in an atmosphere too much deprived of oxygen. This experiment, though imperfect for the purpose intended, brought to the two friends the idea of making researches on germination; and the most curious part of this association of a blind man with a clear-sighted man, was that it was usually Senebier who suggested the experiments, and Huber, the blind man, who executed them.

II.

This is what was known, up to that time, of the works of Huber. He died September 22, 1831, and his life, after 1814, was unknown. It

was, however, not admissible that he should have stopped making observations, after taking so much interest in the subject for 25 years. Moreover, the end of the preface of the second volume of his 1814 edition indicated exactly the opposite.

"I might," said he (New Observations, Vol. 2, page 6) "add several observations to those which I now give to the public; but they do not present a sufficiently connected aggregate, and I prefer to wait till they may be accompanied with facts upon which they have a bearing."

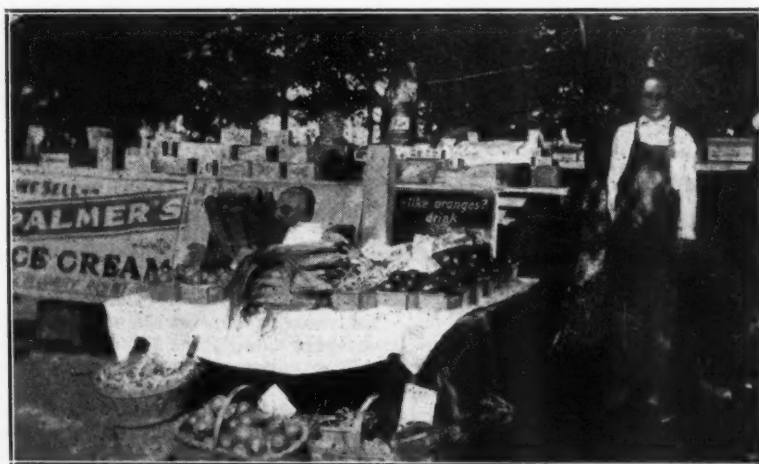
A lucky concurrence of circumstances permits me today to partly make good this shortage.

In 1890, during a visit of apiaries which I made in Savoy, in company with Messrs. De Layens and Cowan, I learned from M. E. Mermey, of Aix-Les-Bains, a young beekeeper who had followed my course of lessons at Nyon, that the father of a neighbor beekeeper, M. Ch. De Loche, possessed among his family papers a number of unedited letters from Francis Huber, addressed to his grandfather, Count Mouxy De Loche. We hastened to visit the Castle of Loche to solicit the permission of reading those letters. The Count was momentarily absent, but we were given the best welcome by his sons, who promised to transmit our request to their father. The latter had the kindness to visit us that same evening at Aix and did me the great favor of entrusting those letters to me with the permission to publish them.

His grandfather, Francis de Mouchy, Count De Loche, born at Gresy-Sur-Aix, in 1756 and deceased in 1837, was an observer and a savant of merit. After having served in the army of the House of Savoy and reached the position of Major General, he had withdrawn to Turin, later to Loche, to devote himself more completely to his taste for natural history and archeological researches. He published a great number of works on natural history, archeology, history, agriculture, etc.

But my good fortune did not end there. When I published, in 1894, a new edition of the remarkable memorandum of A. P. De Candolle upon the author of the "New Observations," I sent a complimentary copy of it to Mr. Georges de Molin, engineer at Lausanne, grandson of Francis Huber. This kind old man hastened to inform me that he was just then busy sorting papers which had been forwarded to his mother by the heirs of his uncle, Pierre Huber, after the death of the latter, and that there were among them quite a number of letters from his grandfather, nearly all relative to bees. Although he believed that his uncle had taken from these letters and perhaps inserted in the "Annals of the Society of Physics" of Geneva anything which might interest scientists, he offered them to me in case I should desire to inspect them. Looking through the above mentioned "Annals," we found no trace of these letters whatever.

In the file of letters which were kindly loaned to me by Mr. De Molin,



New York farmer's roadside market.

I found a certain number of first drafts of letters addressed to Miss Eliza De Portes, at Bois d'Ely, near Crassier. Having obtained information from a friend of the family, I learned that the young lady correspondent of Huber had become Mrs. De Watteville, and that she was residing at Berne.

This venerable lady, now more than octogenarian, was kind enough to loan me the entire collection of those letters, found in a volume of manuscript, and sent with the parcel the following words, which I take the liberty of publishing:

"My niece, who is returning to Bois d'Ely, is kind enough to bring to you the letters of my friend and venerated master, Mr. Huber, of which I have copied a great number in order to make them more easy to read. You may keep them as long as you desire, and may use them freely for your magazine. I will be happy if they can inspire a taste for natural history, together with a simple and fervent piety."

In all those letters, the striking fact is the religious sentiment of Huber, his conscientious spirit, his constant desire of giving credit to his predecessors and his skill in directing and understanding the experiments of his helpers. "I am more certain than you are of what I am telling you," said he to De Candolle, "for you publish that which your own eyes alone have seen, while I take the average of several testimonials."

It would be difficult to show greater philosophy and greater resignation to one's infirmity.

We may admire, also, the correction and clearness of his style, especially in the "New Observations," for we must not forget that he was an octogenarian when he wrote to Miss De Portes, and that his dictation was through two inferior clerks at least: the one to whom he dictated the letters and the one who copied them for the bound manuscript.

One was astonished at all that Huber had discovered; one will be much more so after reading these letters, in which new views and the very best practical suggestions abound. After him, little has been discovered outside of parthenogenesis; his observations were so precise and so positive that all the modern works, however considerable, have only proven a following of his and a confirmation of his, without amending them. For this reason, I believe that the publication of his unedited correspondence will be welcomed with lively interest by beekeepers in all countries, and I here republish the expression of my hearty thanks to Mrs. De Watteville, the Count De Loche, Mr. De Molin, and Mr. Edmond Pictet for their kindness in entrusting to my care, for publication, the unedited writings of the great observer of the bees.

Edouard Bertrand (1897).

(To be Continued.)

(In our next issue will appear the first of the letters written by Huber to Miss Eliza De Portes. These letters give a fascinating account of the observations of the great naturalist).

DO BEES HEAR?

By E. M. Barteau

So far as I am aware, the only affirmative evidence that bees hear is based on the fact of the "piping" and "quahking" of the emerged and unemerged virgins, respectively.

If it could definitely be proven that these pipings, etc., were challenges and answers, it would be further corroborative proof that bees actually hear.

Isn't it a fair assumption that these cries of the young queens are their even-song, like the note of the whip-poorwill and the peeping of frogs at dusk?

Don't we assume the "challenge and answer" of the queens, because of their known antagonism?

Mr. Holterman (page 179, May) says: "I have had no doubt that a pan, or any other noise that would drown the sound of the queen flying, would bring the bees down."

Isn't it a little more likely that the bees are cognizant of the queen's presence by her odor?

We all know how fond the bees are of the hand that has just held a queen, and how quickly they locate a cage that has lately contained a queen, if only for a few minutes.

Isn't it probable that a swarm, when traveling, maintains its elliptical mode of flight in order that the bees be continually brought to the leeward of the queen and thus be sure of her presence—more likely by scent than by sound?

The queenless swarm does not usually cluster; if it does, it soon breaks and returns. Can it discover its queenless condition, when clustered, by the noise of the queen's flight?

Let's attribute it to odor until a more satisfactory answer is given.

As stated above, the queenless swarm usually returns to its hive without clustering.

If you, my dear Mr. Holterman, can succeed in "dishpanning" a queen-right swarm into returning to its hive, we will surely take our hats off to you.

New York.

(On this subject it may be interesting to read the explanations Huber gave, about a hundred years ago, concerning the piping and quahking of the queens. He wrote of a young queen about to hatch:

"We could discern that the silk of the cocoon was cut circularly, a line and a half from the extremity; but the bees being unwilling that she should quit her cell, had soldered the covering to it with some particles of wax. What seemed most singular was, this female emitting a very distinct sound or clacking, from her prison, which became still more audible in the evening, and even consisted of several monotonous notes in rapid succession."

A little farther along he wrote:

"The first queen-cell opened on the 9th. Its young queen was lively, slender and of brown color. . . . When she approached the other royal cells, the bees on guard pulled, bit her and chased her away; their irritation

seemed to be greatly excited against her, and she enjoyed tranquillity only when at a considerable distance from those cells. This proceeding was frequently repeated through the day. She twice emitted the sound; standing, while doing so, with her thorax against a comb, and her wings crossed on her back, in motion, but without being unfolded or farther opened. Whatever might be the cause of her assuming this attitude, the bees were affected by it; all hung down their heads and remained motionless. . . .

"The queen confined in the second cell, which she had not yet left, was heard to pipe several times. . . ."

Surely this piping and quahking is a mode of expressing their anger or restlessness. We hear it often in cages of queens that are being forwarded by mail. Whether the bees have organs of hearing, or not, this indicates that they are more or less affected by the noise produced by angry queens.—Editor.)

DEEP BROOD CHAMBERS

As the end of the season approaches and consideration of wintering requirements intrude upon us, there arises a realization of the rather incompatible conditions which the beekeeper (and the bees) have to face.

Every intelligent beekeeper appreciates the benefits (aye, the necessity) of having a host of young bees as late in the fall as possible, if spring dwindling is to be avoided; and on the other, a sufficiency of winter stores is indispensable. If the combs are occupied with brood at this time, as is desirable, what about space for ample winter stores? The shallow super of honey which is often advised to be left on top cannot serve the purpose as effectively as a store of honey in the brood chamber, more in accord with Nature's methods.

Here is one of the strongest arguments for a deeper brood chamber. It is really regrettable that beekeeping is yet hampered by the legacy of comb-honey necessities and methods. A deeper brood chamber is mentioned as a means to secure greater capacity, as such a change may be realized with the least sacrifice of equipment and with the least trouble.

When compared with the broodnest as built by the bees when not limited by conditions, the ordinary beehive is woefully shallow. The movement of the bees' cluster in winter is pretty well understood, and it is only too well known that the bees often starve with stores near at hand, because they may be unable to move the cluster in a horizontal direction contrary to their natural instinct.

Therefore is it not better to advise the beginners to start out with the deeper brood chambers, and to urge the deepening of hives already used?

Old combs are continually being melted up; why not replace with the deeper frames, and add the proper depth to the hive body? It is an easy matter to add that depth.

D. Queen, New Jersey.

LEGISLATION ON MOVABLE COMB HIVES

By Frank Van Haltern

I would like to take issue with Allen Latham, page 321, in his stand on the enactment of legislation compelling the keeping of bees on movable combs.

Mr. Latham cites cases to illustrate the lack of skill on the part of beekeepers, which is also ignorance and disinterestedness. Besides taking care of our apiaries I have done some inspection work in northeast Kansas and I have found conditions just as bad as he points—and worse. I have found hives with good frames, hives with parts of frames, hives with barrel staves for top bars, and hives with no frames at all. I have found square hives, deep hives, bees in kegs and barrels and—even in washing machines. I have found bees nailed up in boxes of 1 1/4 inch lumber with spikes, tops, bottoms and sides solid, and I have found bees in hives so rotten that they fell to pieces when I raised them to look underneath. I have found hives right side up, up side down, sideways, on top of each other—any old way.

Mr. Latham says: "Let the neighbors keep their box hives." From the standpoint of a selfish beekeeper, I say, let them keep them. I know how to fight disease—they don't. Disease will spread through their bees and theirs will die and they will get little honey, while I will look after mine and will get honey, and there will be no competition for my bee pasture.

But from the standpoint of the bee inspector, I say, I want a law that will stand behind me and back me up when I tell the beekeeper that he must keep his bees or disease is liable to wipe them out, and some of his neighbors at the same time. I want to give him a little compulsory education.

Mr. Latham is right when he says that it is only through education that we shall ever clean this country of bee diseases, and the movable comb hive (note that I do not say movable frame hive) is one of the greatest in the education of the beekeeper if the inspector uses his opportunity. Mr. Latham prefers educating the beekeeper to the movable comb instead of legislating him to it. But how can we make him take the education? In Kansas we compel parents to send their children to school until they are 16. Many now, in school would grow up illiterate if it was not for that law. People shy at education as though it was a pestilence. I have talked until my throat was tired and then had the beekeeper wind up the intercourse with the remark, "Well, I guess I will just let 'em set. If I get some honey it don't cost nothing, and if I don't, I don't care."

There are thousands of beekeepers who are beekeepers only because a swarm came to them and this swarm swarmed and the best they did was to give them a box to go into. They are too busy with other work to take valuable time from it to learn about something in which they are not interested. When we undertake to educate all

beekeepers to correct methods, we have, as a schoolboy would say, some job. About two-thirds of them will not come to bee meetings, they will not read bulletins sent to them free of cost, they will not, or cannot, take time to listen to the inspector and they would not treat their own diseased bees if treatment was not compulsory. I have often explained the advantages of straight combs and good hives, and as soon as the beekeeper found that there was no law compelling him to keep his bees better he lost interest, even though admitting that he ought to do something. But when he was told that he had ten days to treat his diseased bees or the law would be after him, he began to ask questions.

Mr. Latham says it would take longer to go through an apiary of box hives and reach as satisfactory a conclusion than it would to go through an apiary having perfect combs. For my part I have never been able to go through an apiary of box hives and reach anything like a satisfactory conclusion. Box hives cannot be inspected with any reasonable accuracy without tearing them to pieces, in which event, should there be American foulbrood in a hive, it is laid open to robbers. But should no disease be found you have an irate beekeeper to deal with.

In my opinion, a law making movable combs compulsory should not be passed in any State until that State has sufficient inspectors to reach every beekeeper. Then the inspector would locate crooked comb hives and give instructions for transferring, just as he does when he finds disease. Then the next year he could pronounce colonies free from disease with much more certainty than if he had to turn up boxes and dig out pieces of comb from beneath.

As an inspector, I do not care what kind of a hive the beekeeper uses. He can buy it or make it, any old way he

likes. But I do care what kind of a comb he uses. I want the comb to be straight enough to be taken out without too much work, and I want it bounded by a frame that will hold it together. He may keep his bees any way he likes, just so he has his combs in such shape that I can look at all the brood without tearing his hive to pieces. But he will not do this for me unless I have behind me a movable comb law.

Kansas.

DR. NEWELL

We are pleased to be able to reproduce herewith a likeness of Dr. Wilmon Newell, of the Florida College of Agriculture. For years past his name has been frequently mentioned in these columns in connection with his official work or some research problem of interest to the beekeeper. A few months ago announcement was made of his appointment to the position of Dean of the College of Agriculture and Director of the Florida Experiment Station. In his present position Dr. Newell must consider the problems of all phases of agricultural activity common to his State. Knowing his lifelong interest in beekeeping, we feel that the industry will receive all the consideration which its importance justifies on the part of both the College and the Experiment Station.

SHALL WE ENFORCE MOVABLE COMBS?

By Chas. F. Hoser

In August issue, Allen Latham severely criticises the recently passed Pennsylvania bee law prohibiting the keeping of bees in box hives after a certain date. There is much truth in his article, and while I cannot agree with him in all, in the main I do. It is true that most of us rebel against force. We can be led, educated, to do those things that no amount of driving will force us to do.

The box hive should be eliminated if only in the interests of better beekeeping, and no better means of accomplishing its elimination can be found than through our county or local beekeepers' organizations. Every member of a live County Association is on the lookout for bee diseases which may affect his own apiary, or be transmitted from a neighboring apiary, and is ready to do his or her share towards their eradication.

A greater menace than the box hive exists in the sale of honey (unsterilized) from an infected apiary. Proof of this is contained in the article by Elmer G. Carr in August Gleanings. He says: "When the honey barrels were emptied they were rolled upon the freight house platform with bungholes opened, the outside sticky with honey." As a consequence, during a dearth of nectar, the bees from his apiary, within a stone's throw of the freight house, helped themselves, and foulbrood appeared where previously none had existed. The apiary dwindled from forty colonies or more to fifteen, and no crop produced in



Wilmon Newell

three years, causing a large financial loss to Mr. Carr. But little stress has been laid upon the sale of infected honey, and yet such sales should be prohibited unless the honey is thoroughly sterilized. Report has it that foulbrood appeared in and around a large eastern city only after certain honey bottlers had carelessly exposed containers that had been used for infected honey. We know of a beekeeper in Pennsylvania who harvested and sold an immense crop of honey while at the same time fighting foulbrood in his apiaries. Was it right that this honey should be sold without being sterilized? I say no, and that prohibition of sales of such raw honey should be enforced.

Mr. Latham is right regarding movable frame hives. Too often they may become "immovable" movable frame hives, and then they are just as much a menace as box hives. Education is needed, but it should be the kind that will teach that not everyone can keep bees successfully and that it were better not to keep them at all than to keep them slovenly.

Pennsylvania.

(If the beekeepers should make a general effort to prohibit the sale of honey from apiaries in which disease is present it would very probably result in the ruination of the honey markets. Such efforts would result in general newspaper comments which would give the general impression that there was danger of the person eating the honey contracting some disease. The fact is that such statements are already beginning to appear frequently in print. The beekeepers cannot be too careful to make sure that the real facts concerning bee diseases get into print. Foulbrood is now so generally distributed that it would be impossible to limit the sale to those whose apiaries are entirely free from it.—F. C. P.)

SUGGESTIONS FOR OBSERVATIONS

I am interested in "causes," i. e., why things happen. You have no doubt made observations on honey flows in your locality; can you tell me under what conditions the honey flow is extra good, average, and a failure? In what rotation do the extra good years come?

It would be interesting if you would ask beekeepers in the different States and countries to make accurate observations on honey flows before and during the flow, giving the range of the main surplus plants in their localities. For instance, the following table could be filled in daily:

Temperature—day, night.
Weather conditions — Sunshine, cloudy, etc., wind.
Barometer.
Hydrometer.
Soil—water, land.
Elevation.
Form of country, i. e., mountains, table land, etc.
Latitude, longitude.
Phase of moon during honey flow.
Surplus honey flowers.
Duration of flow.

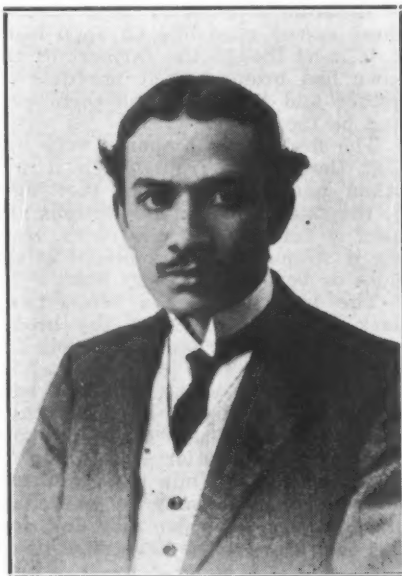
How soon commencing after show of bloom.

Lilian E. Bland.
British Columbia.

(We refer this to our readers for replies.—Editor.)

EDITOR OF THE BEE WORLD

Our readers will be interested in the photograph of A. Z. Abushady, shown on this page. Mr. Abushady is the editor of "The Bee World," published by the Apis Club of England.



A. Z. Abushady.

The Apis Club is an international institute for the study of apiculture and the official organ furnishes a good review of current beekeeping literature of the entire world. References to this publication have appeared frequently in these columns.

QUEEN CAGE CANDY

By Jay Smith

It is an admitted fact that American foulbrood has been spread in candy that has been used to provision cages in which queens are sent through the mail. The law requires that a certificate of health be furnished or that the honey be boiled before being used in making queen candy. Boiled honey is about the poorest food for bees that can be imagined and will cause dysentery and death to the bees and queen if they are confined for any length of time. If a certificate of health is furnished with each shipment showing that no disease exists in the apiary from which the queen is sent, it does not prove that the honey was taken from that apiary. There is nothing to hinder one from using diseased honey and furnishing a health certificate at the same time. I do not mean to infer that anyone would do that intentionally, but there is a possibility that diseased honey might be used accidentally. To overcome the objections named above, it has been recommended that we must invert sugar instead of honey in making queen candy. This has been tried by many beekeepers,

the invert sugar being purchased from manufacturers of that commodity. It answered the purpose very well as long as the shipment was made to a point not far distant, but if the distance were great and if the weather were hot and dry, the candy made with invert sugar would dry out and become hard and the bees would die. Now the chemists maintain that honey and invert sugar are exactly the same, with the exception of the flavor, and this had no bearing on the matter of the candy drying out. But queen breeders proved that candy made with invert sugar did dry out, while that made with honey did not. I was satisfied beyond doubt that the chemist knew what he was about, and I thought I knew what I was about when I proved that the invert sugar candy dried out. The past season I have been investigating and experimenting to find, if possible, where the discrepancy lay. A little simple experiment made it all plain, so that any one can make his own invert sugar and in the regular way make queen cage candy that will not get hard. This candy is in every respect equal to the best article made with honey and in fact it is superior. Several tests were made by provisioning queen cages with the home-made invert sugar and honey and the honey candy became hard before the candy that was made from invert sugar did. For these tests the cages were placed in the attic during our driest weather, when the thermometer was running above 100 degrees every day outdoors, while up in the attic it was as hot as—well, you can imagine what.

In making the investigations, I first tested the boiling point of honey, and invert sugar made by manufacturers. It is known that water boils at a temperature of 212 degrees. As sugar is added and the syrup becomes heavier, the boiling point is higher. I found that honey boils at a temperature of 245 degrees, while the commercial invert sugar boils at a temperature of 235 degrees. This made it plain that the reason that candy made with invert sugar dried out sooner than that made with honey was the fact that invert sugar contained more water and as soon as the water dried out the candy became hard. Some home-made invert sugar was then made by using granulated sugar and tartaric acid, and this was boiled until a temperature of 250 degrees was reached, 5 degrees above the boiling point of honey. This has proved superior to honey from the fact that it is heavier and will not dry out, no matter how hot and dry the weather is. It is a simple matter to make this invert sugar, and anyone can easily make it. A thermometer that will register up to 250 degrees is necessary. To make this invert sugar proceed as follows: To one-half pound of boiling water add one pound of granulated sugar and ten grains of tartaric acid. Allow this to boil slowly, without stirring, till a temperature of 250 degrees is reached. If you have no druggist scales to weigh the tartaric acid, use a scant one-fourth teaspoonful. A

little more or less will not matter, as the acid is not harmful to the bees. I have found that an empty 22 short cartridge holds $2\frac{1}{2}$ grains, so four of these measures will be about right for a pound of sugar. To make the candy proceed the same as in making honey candy. This home-made invert sugar is heavy and thick and will have to be warmed in order to work into candy. Do not warm to a temperature higher than 125 degrees. Put two or three pounds of pulverized sugar on the table and pour onto it some of the warmed invert sugar and knead it into a thick, heavy candy. There is no danger of making it too stiff. If it is inclined to be sticky the next day, work in some more powdered sugar. This is easy to make and will be found even superior to honey candy in every respect.

APIARIAN FLORA

By R. Claustre

Malope. Malope is a kind of mallow, annual and very melliferous, blooming in May, June, July, and in October and November. It seems to grow in all sorts of soils, even really bad. From the same spot at the top of the soil, from 2 to 5 stems grow, which may reach 80 to 150 cm., according to the terrain. Each of those stems bears, every ten centimeters, a ramification of different lengths. At the axils of the branches are clusters of some ten flowers, which bloom one after the other. On each stem, about five centimeters apart, at the axil of the leaves, is also a small cluster of flowers. These flowers are about of the size of those of the creeping mallow, but with brighter colors. Malope may be sowed advantageously to cover the foot of a wall, the leaves being as large as the flat part of a plate. They are of fine green color with the general appearance of those of the creeping mallow, but more rugose and as if varnished. These leaves wilt and fall when blooming begins. The blooming lasts fully a month, and the pollen is of ash-gray color. This blossom is less visited by the bees when the phacelia blooms.

The fruit of the malope resembles a crown, which divides into several segments, containing as many seeds; therefore easy to gather. The seed may be sowed in the bushes along roads. The roots are much less tenacious than those of the common mallow; it is therefore not difficult to eradicate it out of the garden in case of dissatisfaction.

As it is inadvisable to introduce a parasite into your land, be sure to examine the seeds before planting them; a small weevil preys upon them. Plant the seeds under a little soil and 20 to 30 centimeters apart. They may be reset easily.

While phacelia taken from its habitat has not undergone any change, malope sowed at Aix (Ariege, France) reduced the diameter of its flowers and almost doubled the surface of its leaves.—Gazette apicole.

CLEANING SECTIONS

By J. E. Crane

I am cleaning section honey these days. It might seem rather monotonous work to be shut up in a close, hot room and work hour after hour over the sticky sections of honey, but I do not find it so. In fact, I find it quite interesting work, more fascinating even than a new book, for these supers, as they come from the various hives, give me a chance to study the individual characteristics of different colonies of bees. Indeed these supers read like an open book.

It is as though the farmers of the town had brought their products together and I was to look them over and be the judge.

The first super I open I may find that the colony from which it was taken had gnawed away the edges of the foundation in the sections and used it for building the comb, leaving it without any attachment at the sides or bottom, and very light.

The next may have brought up dark bits of wax from the brood-chamber and greatly injured the looks of the comb. Another may be well filled and white, but the bees that filled it seemed to have little sense of the fitness of things and have stored more or less pollen in these sections. While the great majority of sections may be well filled and look very well, we may find now and then such as we have mentioned.

Occasionally we find a super with sections having more or less drone brood, but we are not disposed to find much fault with such, for we have shut off the drone comb from the brood chambers as much as possible. Some colonies seem to use a much larger amount of wax in building their combs than others, for they not only look waxy, but if you cut into them you will find them tough and unsatisfactory. Again we may find supers from hives where the bees have a propensity for gathering propolis rather than honey, and we find every crack and cranny filled with this undesirable material. Not only will the cracks be filled, but the inside of the section too is coated with it, and sometimes even half finished comb gets a coating. So firmly will the sections be glued to the super that it is exceedingly difficult to loosen them without breaking them. Indeed I have broken several this season in trying to take them from the super.

There is undoubtedly a great difference in the amount of propolis that bees gather in different sections of the country, but I believe there is a still greater difference in colonies in the same yard. We find that while one colony is filling its supers with the finest sections of honey, another by its side is storing little but this undesirable propolis.

It is but human that we should desire to destroy the queens from such propolis-gathering colonies and requeen from colonies that have filled the sections given them with white combs, well attached at the sides and with so little propolis that they look,

when filled, as white and clean as when first set up.

Beekeeping is said to be the poetry of rural life, and I am sure one of our greatest joys in beekeeping is in our ability to change an undesirable colony, whose work does not suit us, into one with more desirable qualities; to destroy the unprofitable servants and replace with those that have proved profitable, for we have the power of life and death in our hands, over our industrious subjects. And as I sit and clean one section and super after another I wonder if, after all, I am so much better than the Pharaohs and Neros of ancient days, who exalted one subject and beheaded another as they willed. As I muse over the strange world in which we live, a mud wasp dressed in its brightest color alights on my table. I offer it a sip of honey from the point of my knife. It takes it with a relish. I did not know before that they liked honey. Does it feed its young with honey and pollen? Not at all, for it builds its cells of mud, and as one is completed it lays a small, pearly egg at the bottom and then fills the cell with spiders, after it has stung the spiders so as to paralyze them but not kill them. Then, when the egg hatches it feeds on those spiders—yes, eats them up alive. Hard on the spiders, you say. Yes, but those same spiders have lived on other live things all their lives. It is tit for tat. "Those who live by the sword shall perish by the sword." Why does that mother wasp gather spiders and only spiders for her young? How does she know that stinging them will not unfit them for food for her young? Not one mother wasp in a thousand generations has seen one of her offspring. Surely this is a world where we prey on one another.

"The falcon preys upon the finch,

The finch upon the fly;

And that a rose may breathe its breath,

Something must die."

As I sit cleaning sections, I have time to think and do not find it monotonous.

INTRODUCING QUEENS

By E. M. Barteau

Upon receipt of a queen through the mails, open the hive and remove queen to be replaced. Next remove the new queen from mailing cage, letting her out inside a wire veil; if you haven't one, let her escape onto a window pane, where she can easily be caught and clipped. This done, put her in a Miller cage without attendants. Now take her to the hive and place cage lengthwise and resting on top of two frames, that is, so the space between the frames is directly beneath the cage. If the hive has an inner cover, put it on deep side down; or a queen excluder, or Hodgson escape-board can be used; any arrangement which leaves a bee-space over top of cage, allowing the bees free access to it.

If supers are on the hive, use two excluders, putting the first one on

deep side down, the second one on top of this, deep side up, to prevent the crushing of bees on bottom of super frames. This will allow the bees access to the supers.

Twenty-four hours later, examine to see if bees have removed card from over candy; if not, remove, close hive and do not open again for five days.

If a long time queenless, or if robbing has been going on, wait forty-eight hours before removing card. If convenient, I rub the body of the dead queen on cage. While it isn't essential, theoretically, at least, it seems as though it might, in a degree, allay the first antagonism of the bees towards the new queen.

So far this season I have introduced forty-seven queens without loss, and in one instance the colony was being kept on edge by robbers.

The method is very simple and easy. No shaking or brushing of bees, no removing or spreading of frames, and I believe as safe and efficient as any method yet devised.

(The above method is almost identical with that recommended in paragraph 536 of "The Hive and Honey Bee," and is probably the safest that may be devised, barring the introduction of queens to combs of hatching bees. Leaving the hive alone for several days after introduction is important, as it avoids the excitement often caused by robbers.—Editor.)

SMALL OR LARGE CHAMBERS FOR A HIVE

By C. E. Fowler

Most beekeepers realize that a large super is too large for the bees to enter readily unless there is a heavy flow on.

Some beekeepers hate the small super because the frames are not interchangeable with their large brood-chambers.

Others using the Jumbo style of hive just can't use their brood-chambers for supers, so they try to be contented with two size frames.

Then there is a large number of beekeepers who are either women, or who have women helpers, to whom a large chamber is a very great inconvenience.

Most beekeepers already have large chambers, and not knowing what to do with them and not knowing anything about the advantages of the small chamber, not only keep on using large hives, but keep on talking large hives.

When I first kept bees I scrapped everything but the 10-frame Langstroth. One day I lifted a super of honey off of a hive about 4 feet high, weighing 90 pounds, boiling over with as lively bees as anyone could wish for.

As I was trying to get a perfect system of beekeeping, I immediately adopted the 10-frame 5 11-16 chamber for everything, and have scrapped everything else since.

Now, the advantages of the shallow chamber will pay me on each hive each year enough cash money

to pay for a 10-frame Langstroth hive and the time saved will pay for another one that I have scrapped.

Perhaps some of the ladies would like to know how I do it. For their benefit I will say that, first of all, you must follow a different system.

First, use frames with full sheets of foundation and bottom-starters, with top and bottom bars not over seven-eighths of an inch wide, with the frames of one section directly over the frames of the under one; then the queen, as well as the bees, will go freely all over the hive and some kind of an excluder is necessary.

Second, handle sections instead of frames. In spring when using two sections to 12 L. frames most all queen-cells will be built at the bottom of the top frames, directly in the middle of the brood-chamber, and by raising the top chamber swarming conditions are apparent at a glance.

Third, when swarming fever starts put a section of drawn comb between the two brood sections, making the brood-nest 3 stories, equal to 18 L. frames.

Fourth, always give plenty of super room, and the problem is solved, and you will be happy forever after.

This system, with me this year, prevented swarming entirely and avoided those 57 varieties of tedious swarm control, and all of that Demaree business talked of so much. And, best of all, I got twice the honey with less work than I did before.

If you want comb honey, put your sections on the best hives after the flow is started and the danger of swarming is over, and don't put on any too late to have them finished. One-fourth or one-third comb honey is plenty to supply all demands.

I can uncap 100 pounds of honey in much less time in shallow frames than in regular Langstroth size, and some extractors will hold two shallows in one pocket.

A word about handling frames: In looking for queens, I can handle 20 of my frames as quickly as 10 Langstroth frames without bottom starters, but I don't need to find her except when I requeen.

I am not a bee inspector, but I have traveled with one, and when he comes to a side liner with 5 or 6 swarms in regular Langstroth hives, what does he say before he opens them? Immovable-frame hives; and some need a crowbar and knife to get them out; and don't forget that most beekeepers are side liners, and don't often take frames out, because they dread the immovable-frame hive.

This dread would partly disappear with shallow frames, and many side-liners would graduate to beekeepers and be happy.

New Jersey.

Our correspondent revives something similar to the Heddon system which was so popular for a short time a generation ago. Many beekeepers thought that the ideal system had at last been discovered; but, unfortunately, it did not prove practical.

In the hands of an expert, good re-

sults can be obtained, but without extra attention the bees do not thrive. Wherever the system was generally adopted, beekeeping suffered a great decline, and in many localities hundreds of beekeepers gave up the business as unprofitable. On the other hand, where large hives were used, the beekeepers continued prosperous and remained in the business. Results count far more than theory. Hundreds of pages were given to arguments in support of the divisible hive in the bee magazines of the olden days, but arguments were insufficient to convince the bees. There are very few beekeepers now who use the divisible hive, and the number is smaller every year.

There is much to be said in favor of a shallow extracting super. A shallow brood-nest is quite another thing.—F. C. P.

HIVES IN GROUPS OF SIX

By Hy. W. Sanders

For the past two seasons our home yard has been arranged in groups each consisting of six hives, two of which face south, two east and two west. The idea was derived from a study of the various apiary arrangements, as we felt that the more usual arrangement of hives in long rows was causing us the loss of young queens. During the last season, when we had our hives in rows, two out of every five virgins failed to mate, and it was found that increase was thereby made very expensive, for our season is too short to allow for the retrieving of lost time. The search for the cause of the trouble led us to Langstroth, one of whose sentences is so full of bee-sense and common-sense that it deserves quoting here: "If a traveler should be carried in a dark night, to a hotel in a strange city, and on rising in the morning, should find the streets filled with buildings precisely like it, he would be able to return to his proper place only by previously ascertaining its number, or by counting the houses between it and the corner. Such a numbering faculty, however, was not given to the queen bee, for who, in a state of nature, ever saw a dozen or more hollow trees or other places frequented by bees, standing close together precisely alike in size, shape and color, with their entrances all facing the same way, and at exactly the same height from the ground?"

Dr. Miller's method of putting the hives in pairs was first planned, for he spoke an obvious truth when he said that each hive of the pair held an individuality, and that bees would only make a mistake where the pairs were arranged very close, and that in that case bees from a right-hand side hive would enter the right-hand hive of the next pair, and so on. Then came a study of the A-B-C, and the plan took shape. The hives were arranged in groups of six, as stated, and these groups, or units as we now call them, were then arranged in the yard so that the second row of groups were placed behind the gaps

in the first row, and the third row behind the gaps in the second, and so on. Piles of spare supers were made in one or two places in the yard, partly to save time and steps and partly to help virgins to mark their hives. Some doubts as to the advisability of this were felt at first, for the removal of the piles was bound to occur in the rush of the honey flow, but it worked out all right, for the piles were unchanged while the queens were getting mated, and if any of the other bees got mixed up we never discovered it, anyway.

Since working with this arrangement a couple of seasons, a number of advantages have emerged that were not suspected when the yard was thus laid out. In the first place there is no need now of hive numbers. We used to have them made of tin, following Dr. Miller, and the number stayed with the stand. So if the body of the hive had to be moved, the number had to be transferred, and that took time. Since the new scheme the units have been denominated by a letter and the hives composing it by the numbers from one to six. These numbers run the same with each unit, so that, for example, A1 is the northwest hive of unit A, B1 the northwest hive of Unit B, and so on. The record book now has its pages divided into six, to correspond, and when planning for work in the house it is a real pleasure to be able to "visualize" each hive as the cogitations go on. In changing the location of a hive, for any reason, it is only necessary to make a notation in the book. The colony automatically gets its number from its new location.

Then there is a saving of steps that is no small advantage. In the middle of each unit there is a vacant place about six feet square and the wheelbarrow with tools, etc., or if honey is being taken off, a hand-cart is brought to the north side of the unit where there are no hives. The six colonies are now just handy for work and can all be inspected without

moving more than a step at a time. If brood or honey is needed, or any equalizing arrangements are going on, there is sure to be in the unit one of the six colonies that can spare what is needed. When honey is being taken off it is usually possible to get a load off one unit, and this saves a lot of journeying around to collect enough to go to the honey house.

This season, two more developments are being tried. The first is that during the early months the bees were studied and one sixth of the colonies chosen for increase, these being the best of the stock. In all cases the bees were worked around so as to bring one of the breeders to No. 6 in each unit. This A6, B6, C6, and so on, were all of good enough pedigree to be used for queen-raising. They were built up to good strength, and when the honey season really started, they were dequeened long enough to start them building queen cells. These having been started, others in each unit were treated on the Demaree plan, and brood raised to a third story, and the combs with started queen cells placed here. When ripe they were used for nuclei and this has proved to be the easiest and quickest method of increase from selected colonies that we have found.

The second experiment does not fit in with the first, and it has been tried out on a limited number of units at one end of the yard. Briefly, it consists of removing one hive of the pair at the beginning of the honey flow to throw the field bees into the remaining one. In addition to the field bees, all the brood and bees from the removed hive, except two combs, were added to the hive left on the old stand, and in fact only a two frame nucleus left to the removed colony. The results are justifying the plan, for the strengthened colonies are gathering honey very fast and have to have brood raised every ten days to keep them from swarming, while the removed colonies are building up well, and in some cases the process has been repeated, two of the re-

moved colonies having increased to a point where they have been joined to one strong colony, the weaker being reduced to a two-frame nucleus and removed to a new stand.

The picture shows two units of these nucleus hives at the end of the yard.

Manitoba.

(Louis Scholl, of Texas, places his bees in groups of five, but this is just as good. We usually place our colonies in rows, but they are in woods or orchards, where the trees and shrubs establish great differences in the flight, as bees select certain openings among the trees. When they come home through those openings they have only a very limited number of colonies to choose from, and if there are small plants or shrubs about the hives a very positive difference between them is at once noticed by the bees. It is important.—Editor.)

FREIGHT LOSSES

I wish to say a word concerning waste on railroads, caused by careless handling by railroad men and other causes spoken of by Mr. J. D. Shields in the August number, 1921, page 320, of the American Bee Journal. The trouble is not all with the railroads, although the men they employ are sometimes careless. The loss by breakage is very often caused by the goods poorly crated, or poorly packed, from the desire of the packer to save material.

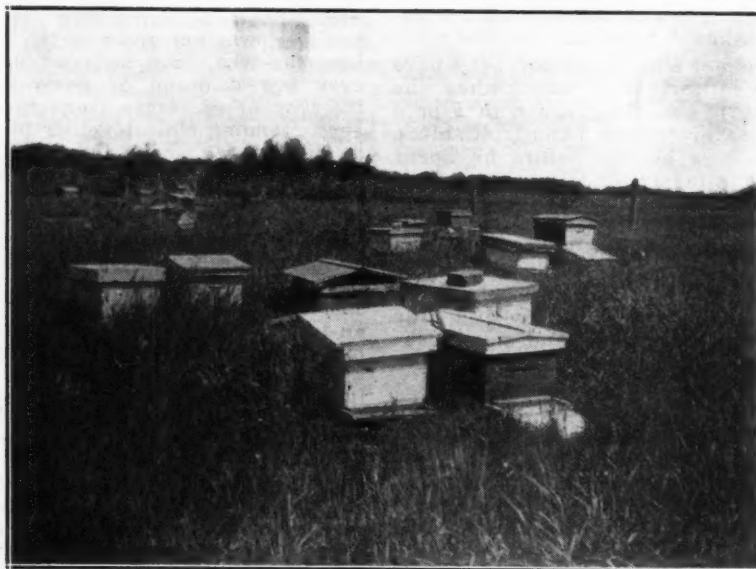
I am a house builder by trade and do some cabinet work and am often called on to do crating and packing for people who are about to move to other localities, and to repair furniture broken in shipment. I have a case in my mind of a man who moved from Pittsburgh, Pa., to Canfield, Ohio. Canfield is located about half way between Pittsburgh and Cleveland. This was not a very long distance to move, but the goods came badly broken. The furniture and dishes were broken. This man then moved to Cleveland. I crated and packed his goods and went with the teamster and helped pack them in the railroad car. Here is where a great deal of the trouble and waste comes in. It is the carelessness of the teamsters or draymen; they place the goods in the car without any regard to order, so that the car will not be full. The railroad crew does not take time to pile anything out of the way, but throw in freight, oftentimes heavy, on top of the goods. Result: broken freight.

In the case of this man moving to Cleveland from Canfield, we packed the goods on one end of the car; packed the goods that were heavy in the bottom, with light goods on top, as high as we could. After the goods arrived in Cleveland the man wrote to me saying nothing was broken.

Another time I packed a lot of goods that went to Washington, D. C., and went through without breakage.

I have sent extracted honey by parcel post a number of times to Pittsburgh, and never had any trouble.

Another thing will help to save



Sanders hives in groups.

waste: Place two addresses on your freight or packages, for if one is lost you will still have another. Do not save your crating material. I believe the shippers are as much to blame for waste and breakage as the railroads are. A. S. Porter, Canfield, O.

SOME EARLY BEEKEEPING HISTORY

(Continued. See July number, page 276).

By G. W. Adams

The failure of the town of Newbury to continue and maintain a municipal apiary does not appear to have discouraged the individual beekeepers and Henry Rolfe, a neighbor, secured "stands" from the abandoned yard. In his will he bequeaths "To my kinsman, Thomas Whittier, a swarm of bees." In the inventory of his estate his bees are valued at 7 pounds 10 s, while his "muskett, fowling pieces and 2 swords and bandoliers" were considered worth only 1 pound 12s. Let us follow the bees bequeathed to "Whittier."

They were taken across the Merrimac to the Whittier homestead, in Haverhill, and under the care of the thrifty Quaker thrive and increased. The farm was inherited by the brothers John and Moses, and a sister, Mary, kept house for them. John, returning from a business trip to Canada, approaching the house by the way of "Pear Tree Lane," just as he was crossing the little stream, the "brook of the barefoot boy, saw—

"Just the same as a month before,
The house and trees;
The barn's brown gable, the vine by
the door—
Nothing changed but the hives of
bees.
Before them, under the garden wall,
Forward and back,
Went drearily singing the chore girl,
small,
Draping each hive with a shred of
black.
Trembling, I listened, the summer sun
Had the chill of snow,
For I knew she was telling the bees
of one
Gone on the journey we all must go."

The writer has it directly from the poet that "Telling the Bees" was not a poetic fancy, but that the incident was just as described in the poem.

The apiary existed until a few years ago, and as the homestead is now under the care of an efficient and loving board of trustees, the writer expects to restore it during the present summer. The latest collection of Whittier's poems contains a very pretty fragment, unfinished, descriptive of the home-coming of his grandmother, Sarah Greenleaf, when as a bride she crossed the Merrimac in her husband's canoe, and walking through the primeval forest came to the clearing where stood the new home, and "from the garden hives came the sound of bees."

In looking up the bees of Amesbury, the administration of the estate of Thomas Barnard, Sr., was of interest,

not only as showing a good-sized apiary, but from a quaintness all its own. I venture to quote from the record:

"Estate of Thomas Barnard, Sr., late of Amesbury, who was killed by the Indians Oct. 9, 1677, to Elenor ys relict, with as many of her husband's children as she could get ordered to come to ye next Salisbury court for a division of ye estate."

The inventory presented shows, among other items, "8 hives of bees." What became of them is not stated, but the eldest son was given "a double portion," and of the real estate it is pleasant to know that "ye widow to receive ye Higgledee Piggleys with other land."

The first use of the word "hive" to appear in our county records is in the inventory of Thomas Barker, of Rowley, in 1650, "2 bee hives and some auld boards, 15 pounds, 7, 6;" the usual term being "stak," "stake" or "stall," and very rarely "stand."

The familiar word "skep," appears but once, and that in 1665, where Bridget Bradstreet, of Ipswich, bequeaths "to my daughter, Kimball, and my daughter, Wallies, my 'skep' of bees, and my desire is that they give there furst swarms to their other too sisters."

From a careful study of the matter the writer is convinced that there were nearly—perhaps quite—as many people keeping bees in Essex and (old) Norfolk counties, in the decade 1660-1670 as in 1910-20, although it is hardly probable there were as many colonies.

There is strong temptation to write here of other things than bees, to show the conditions of life in those days, when nearly every farm had its little apiary. For instance, the Rev. Ezekiel Rogers, founder of Rowley, had "stak of bees (1661) valued at 3 pounds," while his "armour and ammunition" were valued at 5 pounds. Evidently women were then, as now, successful in beekeeping, for 17 years later his widow gives bees to Ann Nelson.

In 1662, John Andrews, of Ipswich, had "tow stocks of bees and tow swarmes." This John never had a "non-skid tire," but he was not only better off than his neighbors in that he owned "a paire of iron-bound wheels."

The same year the estate of "William" Harkes, of Lynn, inventoried bees and also honey, "10 pounds at 17 shillings."

William Patridge, of Salisbury, not only had bees, but a serviceable match-lock musket to protect them, being better armed than Richard Kent, of Newbury, whose "ffoure stakes" were valued at 3 pounds, while his cross-bow at only 2 shillings. Evidently in 1664, when this inventory was taken, the cross-bow was getting out of date.

In the foregoing researches, the writer has learned something of the bees, and not a little of respect for, and admiration of, the men and women who won this beautiful North Shore from the wilderness; and as he pens the familiar names, many of

which are maintained in honor by their descendants still with us, there is a life and reality to this little history which will not leave the heart to be spread upon paper.

After 1670, bee culture declined so rapidly that a colony, which three years before would have been of equal value with three sheep, would bring but 3 shillings. There appeared to be no reason for this, either in change of purchasing power of money or in the presence of any substitute for honey and wax. Although sugar was gradually coming into more general use, it could have had no appreciable effect on beekeeping.

The fact remained, however, that in the space of less than ten years an economic asset greatly valued by the settlers had depreciated in value more than 75 per cent and the production of an article of food highly prized and for which there was no cheaper substitute, was practically abandoned.

Probate records show a decline in value to about 15 per cent of values three to five years earlier, and an apparent decline in the number of bees kept, fully equal to the decline in value.

Seeking a reason for this, we find in the inventory of John Neale, filed 1672: "Three hives of bees, 10 shillings, being somewhat decayed." This is not a bad description of American foulbrood, and the writer is inclined to believe we have here the explanation sought.

Although Quinby was probably the first to recognize the disease in this country, Schirach was investigating it as early as 1771, and it may have been in the colonies with early importations; it is possible that, the country being sparsely settled, it may have burned itself out in a restricted locality and, for want of material, spread no further. Also, a colony sulphured was a colony disinfected, and it was customary to sulphur a dead colony to kill the moths.

Of course, it is possible the appraiser of Neale's estate used the word in the sense Latimer used it in 1550, when he says: "So order the matter that preaching may not decay," and Goldsmith, in the "Deserted Village" uses it in a similar sense, but evidently because he must have something to rhyme with "prey"; so, as this old appraiser was neither a preacher nor a poet, can we not believe he had, as in duty bound, seen the brood, and said just what he meant in plain New England speech?

So rapid was the decline in beekeeping that for the next 30 years—the period of a generation—we find nothing to show commercial value or practical interest.

It was not until the second half of the 18th century that the interest revived, although there is little doubt that a few widely scattered farms still maintained their little apiaries. Perhaps their remoteness had been their protection, and from 1770 to 1800 there was a considerable increase, as is plainly shown in certain old diaries.

From this time the advance was rapid, Langstroth beginning his work

in Andover in 1836, Gould in Wenham a few years later, Alley in Newburyport and later in Hamilton, Chase in Gloucester and Malden, Knight in Haverhill, and others, all doing excellent work and worthy of remembrance.

Massachusetts.

PACKING FOR WINTER IN COLORADO

By J. A. Tracy

A fine way to fix for winter in our most severe weather is to use a 10-frame hive, and reduce to 8 frames, with a division board on each side, and pack the space between them and make a slight frame to fit, bee-space high, with fly screen on the top. Make a small hole in the center of the screen if you wish to feed them in winter. Put on a super or body and fill with sacks or rags, and the bees will be warm enough to continue to raise a little brood, even in the dead of winter. A small can, crown top, with one hole made in center of lid with the point of a two-penny nail, or lath nail, will make a better feeder than you can buy. Don't punch a lot of holes. They can take the syrup plenty fast through just one such hole. You can open the top of such a hive any time in winter and give them syrup, if they are short of stores. The screen, bee-space high, over the bees, to hold the packing up, is a great advantage in that it allows the bees a means to get up over their frames in winter, instead of going around the colder sides. Try it.

WINTERING IN ONTARIO

By J. F. Dunn

I am sending you a photo showing how we winter our bees in Southern Ontario. In the center will be seen our light double-walled hive. We say "light" because it weighs, ready for bees, scarcely more than the ordinary single-walled hive of $\frac{3}{4}$ inch lumber. By using a thin re-saw, we get three boards from 1-inch lumber, and both the inner and outer walls are of $\frac{3}{4}$ inch stuff. This may seem rather light construction, but when insulated with very heavy waterproof paper on both walls next the packing,

it gives just as satisfactory results as we formerly got from $\frac{3}{4}$ inch walls not insulated with paper and with 3 inches of sawdust or planer shavings between walls, and the hive is so light we can, when the colony is fed up for winter, pick it up and carry it with no more effort than with a single-walled hive of $\frac{3}{4}$ inch lumber. We are in Niagara district (the fruit district of Ontario), where the thermometer seldom reaches zero and 1 inch of packing between walls is all that is necessary here. If we were using any other packing than regranulated cork 1 inch would not be enough. We live but a few miles from one of the few cork factories in America and know the "cork board" process from the raw cork to the finished product. "Cork chips," about which we read so much in the bee journals is simply raw cork broken up fine, and while it is rated high in insulation, it is in no way to be compared with what is known as "regranulated cork." Regranulated cork is a by product of "cork board." The raw cork as it comes to the factory is broken up into blocks and then pulverized into what is called cork chips. Cork chips is untreated cork, and contains volatile substances and some moisture. In the manufacture of cork board, the cork chips are treated to remove all the volatile substances that lessen insulation. It is then put under immense pressure and formed into large squares to fit between the walls of steel vaults or in large refrigerators. It is then passed very slowly through the ovens until it is thoroughly baked, and with the previous treatment every bit of moisture is driven out of it. While the raw cork will take up some moisture the treated product will not. After coming from the ovens the large blocks of cork board are squared up with special machinery and the trimmings are ground almost as finely as flour. Exhaustive experiments at one of our agricultural colleges placed this product just where we have always considered it, at 100 per cent, or the very highest in insulation. We have tested it for years alongside almost all known insulators and in our opinion it stands at the head.

The Barrel Winter Nest

At the left stands the barrel pack-

ing case. It is some larger than the ordinary flour barrel and just right for a ten-frame hive placed on end. If packed with forest leaves it will do very well if given a coat of regular waterproof roof paint, but if any other packing material should be used I would wrap the barrel with waterproof paper. At the bottom of the barrel will be seen the strip of tin (showing white) that covers the fly hole $\frac{3}{4}$ in. wide and $3\frac{1}{2}$ in. high, cut in the stave. The tin extends below the fly hole to shut out the draft and prevent clogging with sleet. Before the hive, shown at top of barrel, is let down into the barrel (entrance first) a wire is passed around the hive to life it out by when unpacking. The hive rests on cleats 8 inches above the bottom of the barrel and forest leaves are packed in the bottom before the hive is put in. A "bridge" connects the entrance of the hive with the fly hole and the hive entrance is about $1\frac{1}{2}$ inches above the top of the fly hole. No drafts, no matter how hard the wind blows, ever touch the inside of the hive. We can buy the barrels for 50c and sometimes less. We pack the barrel to the top with forest leaves and round the packing up at the top, tie a waterproof paper over the top, and we have about as snug a winter nest as could be given a colony of bees.

The Community Hive

How do you like it? Before they were converted they were just ordinary single-walled hives like their neighbor, setting on top the barrel. Well, we are in love with them and I guess we shall run a whole apiary on the community plan. We call it the community hive because there is no reason why there should not be a whole quartet of them, side by side, instead of a duet. The hives are exactly level and entrances may be reversed, every other colony. Like the old darkey's trap, it is "set to catch 'em goin' or comin'." The front and rear of each hive are double walled. The sides are single walled and of $\frac{3}{4}$ inch lumber. The hives can be used for supers or brood chambers. Bottom-boards are the ordinary ones for single-walled hives, except that we pack them with cork and insulate them with paper. We want the front of our bottom boards enough shorter than the fronts of the hive, that no ice or sleet ever touch the entrance. On the "weather side" of each outside hive we remove two brood-frames, wintering on eight frames. The empty space is filled with a cork packed (2 in. thick) dummy, the sides of which are covered with heavy cardboard (shredded wheat biscuit cartons are fine), and the cardboard painted with shellac; or, better still, melted propolis. This dummy is of $\frac{3}{4}$ inch lumber and hangs in the hive like a brood frame. We make it three-sixteenths inch shorter than the inside of the hive, front to rear, and cut the cardboard sides one-quarter longer than the inside measurement of the hive, and we crowd it tightly against the inside of the hive wall. A No. 12 soft wire is then passed around the



Dunn's winter plans.

cluster of nails and a round stick shown in the photos is twisted up until the hives are drawn so tightly together that no cold or frost can get in. A piece of insulating paper reaching from top of super to bottom of brood chamber, is placed between the hives before they are forced together. A similar wire is also run around the supers; a stick slipped under the wire and twisted up tightly. In the photo the deep super is packed with forest leaves and the half story with cork. We prefer to have the full depth super on the whole community with double-walled front and rear. At the advent of fruit bloom we take the packing from the supers, crowd in a dummy on weather sides of supers, fill the top stories with empty combs and get them by clover time as nearly as possible solid with brood. When clover opens up we put the queens below, put on the queen excluders, then a full super of combs and place the brood on top. At the end of ten days we take what brood we want for increase (we get very few swarms) and cut out the cells in the rest of the combs. Of course, we spread the hives apart at clover time. We pack the supers with any good insulating material that may be handy, regranulated cork, old forest leaves shredded up fine, finely cut straw, cork chips, forest leaves freshly gathered, sawdust and planer shavings mixed. We place them in the order we believe to be their relative value in bringing bees through the winter. We fill the supers with packing to within an inch and a half of top, put on the honey-boards, put a waterproof paper on top of that and covering all the hives. Then the regular covers. Any wet that gets in where covers touch each other is caught by the waterproof paper.

Ontario.

SUNSHINE AND BEES

By Allen Latham

This is being written on January 13, the coldest day of the year in Connecticut thus far. It is a clear day with the wind right out of the north, the temperature ranging from 14 to 21 above. At 10 o'clock, when the temperature was about 18, I went to the apiary to look at the thermometer, which is thrust through the packing of a small colony which I am experimenting with. Just as I thrust the thermometer back a bee crawled from the tube entrance and took flight. I stepped aside that the bee might have an unobstructed return to the hive. In less than three seconds she came back, glad to crawl into the warm interior of her home.

Some of my readers may see nothing remarkable about the statements in the paragraph above, but I see enough to warrant writing a few more paragraphs relative to the suggestions which rise. Now we are ordinarily taught that bees cannot safely fly unless the temperature is at least 50 in the shade and are told that even then the wind should not be blowing. But here a bee flies when the temperature is 22 degrees lower than is safe, and there is a brisk wind right out of

the north. How is this to be accounted for?

That bee was a healthy, strong bee. As soon as it felt the chill of the air it returned briskly to the hive. Had it been a sick bee or a weakling it would have flown dizzily about, would soon have lighted on some object, and probably never have returned to the hive. It is true that a general flight of bees when the temperature is much below 50, or when the wind is blowing, is often disastrous. It is not true that healthy bees are lost when they fly out during a bright winter day.

A few days ago an amateur wrote to me expressing regret because he had not been at home a certain day recently when his bees took flight. He had his entrances shaded against wind and sunshine. The bees found it difficult to get out and back with the obstructing boards in place. Many bees were lost because of getting chilled before they could find their way back into the hive. Had the beekeeper been there he would have removed the boards and thus allowed the bees a free pathway.

Are such boards a detriment, or are they of real value?

Personally I consider such devices, as a rule, a real menace to the good health of the colony. There may be isolated instances, such as colonies with a northerly exposure, in which a benefit might accrue from the boards being in place; but under all ordinary circumstances those boards are worse than valueless, for they are a source of harm to the bees.

When I say the boards are a source of harm I do not refer to the loss of bees that might occur in case the bees had a flight in the absence of the beekeeper, but I refer to harm that results from their presence upon any sunny day. I venture to say that there are no animals that are more in need of sunshine than are honeybees. Sunshine is a tonic to bee life, it is the natural panacea for all the ills of bees. Nothing so invigorates a colony of bees as a sunny day.

I like to have the sun shine into the entrances of my hives. What if it does entice a few bees to fly out? Ten to one all healthy bees that fly out succeed in returning. Those that do not return would have died in the hive within a few days anyway. Personally I prefer to have bees die outside rather than inside the hive. Dead bees in the hive have absolutely no value, and when accumulated in quantity are extremely detrimental to the welfare of the colony. It is quite possible that a colony exposed to the full glare of the sunlight all through the winter might have a few less live bees the middle of March than if it had had its entrance shaded. But would it be true that the same colony would have less bees three weeks later?

Eight thousand bees that are vigorous the first of March will carry along a colony better than 18,000 that are sickly. By the end of three weeks only a thousand or two of the eight will be gone, whereas 14,000 or 15,000 of the 16,000 will be gone. By

the 10th of April the colony which has had the invigorating effect of sunny winter days will be better off than that colony which has not had the benefit of sunshine. After thirty-six years of experience in wintering bees outside, I now have absolutely no use for boards to shade the entrance. I like the sun to be on those hives not less than four days of every week of the year.

Last winter (1919-20), one of the most disastrous to bees for a generation, there were some six weeks during January and February when the sun scarcely appeared to view. Day after day of clouds with a low temperature. For eight days at a stretch we did not have ten minutes of continuous sunshine. Bees could not carry out their dead; the dead accumulated about the entrance. Colonies were unusually strong in old bees, as no fall flow of honey had killed off the field force. By the 1st of February nearly every colony had its entrance completely covered with dead bees. In some cases the dead lay two inches deep about the entrance. Then came a sleet storm which sealed the entrances with ice. The result was awful.

This winter mild temperatures and sunny days have allowed the bees to carry out their dead on the average of twice every week since the first of December. The hive bottoms are today as clean as in summer, except for a few capping-gnawings. Bees are so snappy that they fly out into the cold air with impunity, at once returning when they feel the chill. Let the sunshine in.

WINTERING BEES IN THE SOUTH

By L. B. Smith

Having had many years of experience in wintering bees in a warm climate, much the same as Southern California, I thought a few lines on that subject from me would be permissible, especially as I am asked that question frequently.

This will, if used, appear a little out of season, but most real beekeepers save their Journals and read them at their leisure time; it may be useful to them later on. I don't think, but know, the very best place for all combs is in care of the bees, here in this warm climate, let that be winter or summer.

I have many colonies now tiered up four and five stories high, with full depth bodies, and I will have as strong colonies, or stronger ones, in these tiered up hives, as the man who has gone to the extra trouble and expense of removing and caring for these combs.

As for perfect wintering, I would not give five cents to have every colony insured. "Oh!" says one, "haven't you read what Prof. Jiggs says of the winter problem in the South, or our Government Expert, Jimmy Jones, has said?" Sure, I have read most everything published in the various books and journals, for many years, concerning bees.

With all due respect for our Government experts and professors (they

have taught us much) it is hard, at least for me, to believe that all this talk about the winter problem and winter protection in the Southern States is necessary.

Let me give the very best packing a colony can have in any of the Southern States, that is, a good strong colony of bees with a young, prolific queen and 50 to 60 pounds of honey. This may seem extravagant as to the amount of stores, but is not a bit too much for our warm climate, when bees fly most every day and often keep up brood rearing all winter.

With the above condition present, I would not hesitate to insure perfect wintering of every healthy colony of bees in any of the Southern States. Pay no attention to the number of combs a colony has, let it be one or five supers.

The only requirement is to contract the entrance against the mice and robber bees, as we have so many days that bees can gather nothing to speak of, through the winter, so robbers often become a real nuisance in the South.

Now, to the doubting Thomas, let me say: Try half your colonies packed my way, the other half packed the real orthodox way, with all surplus combs removed and the usual 25 to 30 pounds of stores to the colony.

I would not have you believe that I think these extra combs of special advantage to the wintering of your bees. I am equally sure that they are in no way detrimental.

The combs are always safe in the care of the bees, not so otherwise in this warm climate, for we often have warm weather here, even in mid-winter, when the larvæ of waxmoths seriously damage, or destroy combs.

I noticed in Mrs. Grace Allen's department, in *Gleanings*, that she tried packing the bees in Tennessee and it proved of not practical benefit. I know there are many things said by prominent writers of the North that are all right in the North, but will not stand up when put to a practical test in the South. Most of the Northern writers say: Face your hives to the south, or east, for best results. This, no doubt, is good advice where bees are confined for weeks, even months, to their hives without a flight.

Here hives facing north or west, are more favorable to the bees than a south or east exposure, especially where bees have almost daily flight. It is not the greatest, but the fewest number of flights we want our bees to have here. All practical beekeepers know these daily flights mean a large consumption of stores and a heavy tax on the strength and vitality of the bees.

Texas.

The Bees

When winter winds have ceased to blow,
And sun has dried the mud and snow,
The bee man hurries to and fro
Among his hives.

He takes the winter wrappings off
And with a deprecating cough
Informs the bees the lid is off,
It's time to work.

Some colonies are good and strong,
While others need a boost along;
Perhaps increasing late was wrong,
Unite a few.

He hunts each queen from hiding place,
And makes her promise to his face
That she will propagate a race
Of workers strong.

Each comb is lifted out with care
To see what are conditions there.
It's a lot of fun, but I'll stay where
There are no bees.

—Nellie M. Sheldon.

BEEKEEPERS BY THE WAY

A Maine Beekeeper

There is a very general impression that New England is poor country for beekeeping. Lester W. Longfellow, of Hallowell, Maine, is a beekeeper whose returns compare favorably with those of many sections famous for honey production. Mr. Longfellow is President of the Maine Beekeepers' Association and is devoting much time and attention to the interests of the new organization. In partnership with his brother, Longfellow keeps 300 colonies in several yards. The average return is about 100 pounds per colony in Northern Maine, and about 75 pounds in the central part of the State. He states that there is much good territory which is unoccupied in Northern Maine. Clover is the principal source, with some good raspberry locations and some places where fireweed is abundant.



Lester W. Longfellow, President of Maine Beekeepers' Association.

BEEES AT SORGHUM MILLS

I am a beekeeper and live on a farm and make more clear money from the bees than we do from our 100-acre farm. I have increased until I have 100 colonies in fine shape for this season. Last year I began the season with 86 colonies and sold \$1,162.90 of honey. I am having a little trouble with swarming; have had 5 swarms so far, but am trying to hold them together until I can begin to extract; after that I will not be troubled. I am stating these facts so that you may know that I am a beekeeper. The last year or two of scarcity of sweets of all kinds developed the industry of sorghum making near by.

Last year there were three sorghum mills located as follows: One one-quarter mile, on one-half mile and one three quarters mile from my apiary.

Last year being dry, fall flowers were rather scarce, causing a dearth of honey, so these sorghum mills attracted the bees, and they swarmed around them so badly that they caused much annoyance and trouble to the operators of these mills. I lost my field bees by the millions, consequently I did not get my usual fall crop of honey. However, I heard no serious complaint by the sorghum men. I think they bore the trouble well, because they thought they were ruining my apiary for all time.

I have heard it rumored recently since they see me doing business on the old stand with more bees than ever, that they are going to put me out of business this fall; and they really believe that I will have to kill out my bees if they insist, because it interferes with their business. I would like to know what my rights are as a beekeeper and what course I should pursue to be doing the right thing by them and myself as well.

I have a fine home trade on honey and I have a ready sale at all times; can't possibly supply my trade.

Each of these mills is operated out in the open and their output is only a few hundred gallons. My crop of honey is worth three times as much as the entire output of these mills. I would like very much to see this discussed in the columns of the *American Bee Journal*; perhaps some reader can and will advise me what to do in case conditions cause the bees to interfere with the sorghum men. With a good fall flow, I hardly think the bees would bother the mills. I will add that I have been keeping bees ever since 1902; have never had any trouble with my neighbors on account of the bees.

H. C. Gadberry.
Missouri.

Answer: This is one of the unfortunate happenings of bad seasons. Sorghum mills, cider presses, wine presses, candy stores, dry fruit preserving and dozens of other little industries not only suffer from the bees' short crop, but cause the bees to suffer, since many of them get drowned or killed in the vats, in the presses, and wherever sweets are gathered.

This is not the only harm it does to the beekeeper. His bees gather some

of this objectionable stuff, whether cider, wine or molasses, and when this is stored in the cells, it is apt to make them sick during the winter, for most of it will sour in the cells and give the bees dysentery or diarrhea.

Luckily, this happens only one year in twenty, or even less. We remember the fall of 1879, when all those of our neighbors who had either cider or wine to make cursed our bees and their owner. But it never happened again, and the neighbors now know that in such an occurrence we are as much the losers as they are, if not more.

If this should happen again to you in such a way as to make the matter irksome, it would be best to try to have an understanding with the makers of sorghum molasses. Since it is a loss to both, and they cannot compel you to move any more than you can compel them to quit, the best thing to do would be to put up sheds in which to boil the juice. A sorghum boiler ought to be under a shed, owing to the number of wasps, flies and other insects that drown in the hot juice, and there might be laws passed compelling it, in order to make the molasses more healthy to the consumer. Could you not get them to agree to get under shelter and spend a few dollars to help them do it? It would be better than going to law about it. What say our readers?

DECEPTIVE HONEY FLORA

By John Prothero

Every beekeeper who maintains a close observation on the honey flora of his neighborhood will have noticed the difference in the behavior of the bees during various flows, and the discrepancy between the fuss made over certain blooms and the amount of nectar stored. Some flowers seem to fascinate the bees and to keep them busy without giving a corresponding yield. Catnip is often mentioned as an example of this. Bees will gather on a clump of catnip and fuss with a great air of business, yet the general verdict is that they get little nectar. This phenomenon sometimes leads the enthusiastic amateur into futile expenditure. He will plant catnip or mignonette or sunflower in quantity on a patch of waste land, where sweet clover could be put to better advantage.

Of course, this is like growing wheat in flower pots to provide the household with bread, but the enthusiastic amateur is to be encouraged, even if he only plants a quarter of an acre of bee forage.

This season I have noticed trifolium arvense, or rabbit's foot clover, as coming into this category. The common white clover produced little or no nectar and was neglected by the bees for this modest purple-grey relative. Here it occurs in great quantity in pasture and waste land, and observation this year would have led one to suppose that a considerable honey flow was on. The bees were thick on it all day and hustled from bloom to bloom in their most professional manner, but examination of the combs showed that it was much ado

about nothing. The tubes are so fine and so numerous that one readily understands what a tiresome and unremunerative job it must be. The busy bee is wanting in a proper sense of economics; she will expend a dollar's worth of energy to get a 75-cent return. She does it because she is driven by instinct, which, like justice, is blind. Primeval man spent a month rubbing a flint into an arrow head; he was driven by personal dislike of a neighbor, and, being gifted with reason, considered the motive adequate.

Sweet clover I should bring forward as being the opposite end of the pole to catnip and rabbit's foot clover. There is a quiet, steady, unobtrusive industry about the apiary when the sweet clover harvest is in full swing that is most deceptive. When the orchards are in full blossom in April there is an air of desperate hustle which is absent during this later and more productive flow. Unless I am mistaken, there is in fruit blossom time less swaying and zigzagging in their final descent to the hives; they come back full pelt with the same directness with which they go out. During sweet clover they come home with a quiet, swaying movement and a contented hum. Can it be that their instinct tells them that there is every need to hustle over the fruit blossom, but that there is plenty of time with the sweet clover? I seem to have noticed a similar rush over the buckwheat, which here yields from about 8 to 10 a. m. After this is over they settle down in a more leisurely manner to search through the expiring sourwood supply for any pickings there may be left. Their demeanor is quite different. For those two hours in the morning there is fierce concentration of purpose; afterwards it is jog through the day's work and enjoy life.

I may be advancing a fanciful theory, but it seems to me that there is a direct relation between the duration of a flow and the behavior of the bees while it is on, a relation which does not correspond with the quantity of nectar being brought in.

My belief is that more nectar is brought in with less fuss during a day of sweet clover than during a day of fruit blossom or buckwheat, making every allowance for hive strength. Perhaps it is not right to class fruit blossom and buckwheat together, for in one case the bee takes a long, strong pull and in the other rushes desperately from one small blossom to another, yet in both instances there is an imminent stoppage of the flow to spur them on. The beginner is often deceived in this way on the supering question. He imagines that there is comparatively little doing and lots of room at a time when things are filling up very rapidly; again, after a spell of great superficial activity he is deceived to find poor results. This is one of the matters which make knowledge of your locality two-thirds of beekeeping. A good honey flow in one neighborhood and season becomes unproductive fuss elsewhere. One is often surprised to hear the lukewarm

manner with which a beeman from 50 miles distant will speak of a plant that gives one excellent returns, and vice versa. Around here men speak meanly of white clover, though there is plenty of it; 60 miles to the west it is the main honey crop. Verily there is no end to the "reports" that might be written on honey flora and their value; even State lines and counties would not make satisfactory divisions. Such reports are interesting and informative, but the beeman has only one safe guide to follow—make your own observations, draw your own deductions, and originate your own practice accordingly.

Virginia.

CHILIAN BEEKEEPING

Dear Mr. Dadant: I believe that I wrote you a few years ago, that we did not have either moths or foulbrood in Chile. I am sorry to say that it is not so now. I believe that I have foulbrood in my apiaries and wish to ask your advice, for description and cure. I have 11 apiaries, 6 in the mountains, 5 in the plains. The former, having no neighboring apiaries, are safe. The others are surrounded with smaller apiaries. As I was certain that there was no foulbrood, I did not take any precautions concerning hives, combs, supers, honey for feeding, etc., and used to carry things from one apiary to another without fear. So I have probably scattered the disease myself.

Last winter a Chilean apiarist who owns over a thousand colonies in box hives, told me that he had to buy 200 to 300 hives of bees every year to sustain the number of his colonies, as he lost so many that the natural swarms did not replace the losses; that the colonies died with plenty of honey but no bees. I did not pay much attention to his statements. But this spring, after having had more swarms than usual, about 20 per cent. I noticed that many colonies were getting weak during the dearth that usually follows the swarming season. When the alfalfa season came, they were reduced to the size of nuclei. The queens were still large and fine looking, but there was very little brood, almost nothing but eggs. The larvae must have died as fast as hatched, perhaps killed by the food given them. Rarely could I see a big larva, dead and yellowish in color. But they did not have any bad smell when rotten, and the color was gray, not brown, without any copiness. There were only a few in that condition, as the bees appeared to dispose of them. Rarely was there a sealed cell with a hole in it.

During the honey harvest they did not improve, so I united them by twos and later doubled them again, so that many families are formed of 4 colonies and have hardly strength enough for winter.

Without any disease, I could care for a large number of colonies, but with diseases I will have to shrink my output. Besides, the prices that we are getting for honey are only about 40 per cent of last year's prices; exchange is low, and all im-

ported articles are out of reach in price. That is enough to discourage any one. It takes 100 kilos (220 lbs.) of honey to pay for an ordinary umbrella; the same amount to pay for a case of gasoline; 600 kilos (1,320 lbs.) to pay for a rubber tire 31x4 for my auto. I understand that your beekeepers are better off, and it gives me great desire of coming to the United States and see. Perhaps I will come some day.

Do you use the capping-melter? How does it succeed? Does it damage the honey? I have considerable trouble with small particles of cappings that gather on top of the honey after extracting, and as I have so large a quantity (509 barrels this year) I want some good method of getting rid of these cappings. I do the extracting in a tent the edges of which are held down with big rocks, excepting the front, which is allowed to drop to the ground as we go in and out. I would like to have a central plant, but it is out of the question, on account of bad roads and long distances. Last year I had typhoid fever in the middle of the summer and had to delay extracting until cold weather. I did the work when there was snow and rain and had to warm up the supers with a stove under a pile of them, in order to warm up the honey so as to uncap and extract.

Let me hear from you, please, with advice as to what you think of the situation. G. J.

(It looks as if our correspondent's bees were suffering from some disease like European foulbrood. We are sending him some information on the subject.—Editor).

THE CENTURY PLANT

In the Southwestern States, Mexico and Central America, there are a number of long-lived plants, commonly spoken of as century plants. These belong to the genus *Agave*, more than 138 species of which have been described. Many of them are native to Africa and desert regions of Asia. Coulter lists seven species as native

to Texas, and some others are to be found in Arizona, New Mexico and California.

The flower stalks often rise to a height of forty feet or more and are a striking feature of the southwestern landscape. The fleshy leaves are armed with thorns or prickles to resist attacks of hungry animals, and the thick leaves hold large quantities of water, so they are well adapted to survive in a region of almost constant sunshine and little rainfall.

The plants grow slowly, usually maturing in from three to fifteen years in their native regions. Although the bloom is infrequent, enormous quantities of nectar are available when the plants do bloom. There are few plants which yield so copiously. The picture gives a good idea of the appearance of the plant before the flower stalk appears.

SAVING A CHILLED QUEEN

By Elias Fox

In April, 1920, we had some bad weather. One morning while looking for bees which might be short of stores, I noticed a double handful of apparently dead bees outside the entrance of a hive. On top of the pile was a nice yellow queen. On picking her up I could detect no signs of life, but placed her on the kitchen table about 8 feet from the stove. After half an hour she still showed no signs of life, but an hour later I found that she had turned over on her feet, but showed no apparent movement otherwise. A little warm honey placed directly under her tongue had the desired effect, and in a few minutes she was able to walk about.

The hive was then brought in and a handful of the bees likewise revived. In a couple of weeks I found they had two small patches of brood, so the remnant was transferred to a colony which was queenless. Later a strong colony resulted, and the chilled queen with her offspring produced as much honey as others which had been more fortunate.

This queen was the nearest gone of any with which I have come in con-

tact in my 40 years as a beekeeper. Wisconsin.

THE QUEEN MATED, BUT COULD NOT LAY

By Vernon H. Jeffries

While transferring some of my bees from some of my nucleus boxes I found one of my queens with a little hard substance that resembled an egg hanging on to her. I knew that there must be something the matter with her, for all of the other queens that were put off the same time were laying right along and were doing fine.

So I caught her and pulled it off of her just with my fingers alone, and when I turned her loose she took wing and went into another hive close to where I was working, and of course the bees balled her at once, knowing that she was a stranger, and I had to work in a hurry to get her out of there. So I caught her and put her in her own hive and the rascal flew out again. I put the top on and made a note of the hive in my note book, so I could give them a queen cell or brood, and they could go on to work.

Two or three days after giving brood I went back to see how they were getting on, and the first thing I saw was a very nice looking queen running over the combs dropping eggs in every cell the same as any other queen I have.

I saw a piece in the American Bee Journal some time back something similar to the above, and I suppose that helped me out a lot. I will be on the lookout for such things hereafter and maybe can save a good many queens.

Louisiana.

(Usually when queens mate, the organ of the drone remains attached to the abdomen of the female. Usually the workers pull this away. Evidently in this case it had not been done, and it is quite probable that she could not have laid any eggs if you had not helped her out.—Editor.)

RULES FOR THE PACKING OF BULK COMB HONEY

A recent bulletin sent out by the Texas Honey Producers' Association gives their rules for the packing of bulk comb honey. As the packing of this article is practiced more than in former years, we give them herewith:

Pack in new cans only.

Use 3, 5 and 10-lb. friction-top cans, putting most of your crop in 10's.

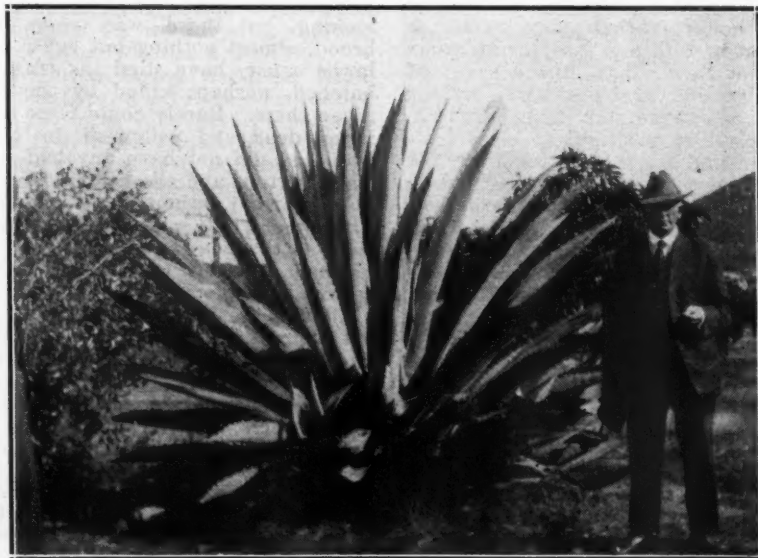
Use only white comb, drawn the present season, and made on thin surplus or extra thin super foundation.

All comb must be completely sealed.

No comb in which brood has been raised or that is discolored from any cause can be used.

Use only the pieces of comb cut in square blocks. The comb should be of a size to just pass through the mouth of the can, and then lie flat.

Fill the can with comb first, then



Century plant in Southern California.

fill with extracted honey until the net weight is made up.

Extracted honey used must be white and of the same flavor as contained in the comb.

The extracted honey must be free from all foreign matter.

The extracted honey must have been heated to a temperature of not less than 120 degrees F. and not more than 145 degrees F., and carefully strained.

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

Tobacco Smoke

I always use a veil, but once left it at my apiary in East Texas; so I put a cigarette in my mouth and smoked it till I got through with them. I took the frames out one by one to see how they were, and not a bee came around my face. I think if one has no veil and has a cigarette in his pocket he may use it as a veil. What do you think about it? I do not smoke much, but I tried it on my bees and it seemed to work all right.

TEXAS.

Answer.—That is the Swiss and German way. They sell pipes for beekeepers. A cigarette will do, but it would take a great many for a day's work. It would be rather expensive. Then it is not exactly proof against stings, for some bees may get angry. In addition to this, not everybody is fond of tobacco. However, we do not wish to be exclusive and are quite willing that those who like tobacco should use it.

Prior Rights

Could you please tell me if there is a law in the State of Wisconsin bidding people keeping all the bees they like? We bought our farm in the year 1919, with the intention of keeping bees, but before we got our apiary started there was another beekeeper bought 30 rods south of us and moved up here with 130 colonies, the same fall. He was telling me that seeing he was here first I had no right to keep more than 25 or 30 colonies. in the same neighborhood

WISCONSIN.

Answer.—There is no law that we know of to keep people from having as many colonies as they see fit on the same piece of ground. But there is no doubt that there is a moral right for the first man who keeps bees, to the spot which he occupies.

Moreover, it will be profitable for neither the one nor the other to have too many colonies in the one spot.

So our advice to you would be to keep your bees a couple of miles away, or even farther. It is certainly unfortunate that you should not have started first with bees in that spot.

We have a great many of our bees in outapiaries and we often find it more profitable to keep them away from home than right at home, as our home location is not very good. It does not take very much time to get to the outapiaries, and we have a free field for the bees.

Inbreeding

I started with one colony of bees, headed by a select tested queen. Now have two daughters and two granddaughters from this queen and no new stock has been introduced. One of these granddaughters is a large, fine-looking queen, while the other is only an average

All cans must have the lids properly placed and must be clean.

All bulk comb honey sold through the Association must have the Association label affixed by the producer.

All bulk comb honey returned to the Association by the jobbers, or that should not have been correctly packed, will be prepared for sale as extracted honey by the Association, at a charge of 2 cents per pound, and the cost of the new containers.

size. These queens have just commenced to lay. If they fill the combs with brood would there be any advantage in requeening with stock from a reliable queen breeder? I have read that inbreeding tends to produce smaller and less hardy bees. Is this correct?

WEST VIRGINIA.

Answer.—With this small number of colonies you need not be afraid of in-and-in breeding, for there must certainly be other bees in the vicinity. The only thing you need to bother with is to make sure that your queens are purely mated. This is probably doubtful, unless the bees in the neighborhood are Italian. If your queens are purely mated, you run but little risk of inbreeding. But if they are ill-mated, then you had best get additional stock from some breeder.

Inbreeding for a long term of years does produce less hardy bees, though we have never noticed them getting any smaller.

Cross Bees

I have bees in a bee house and they are very cross. A neighbor tells me that bees are always cross when kept in a bee house. What can you say about it?

Answer.—There can be but one cause to make bees angry which are kept in a bee house; that is if they are on a floor or the hives are all in one wall fastened to each other. When you go in the house, the least jar of the floor will disturb the bees and they will be on the alert. Similarly, if they are in a wall all fastened together, when you disturb one hive, the other colonies will all feel the disturbance and will be apt to resent it. It is well to have each colony on its own stand, entirely separate from all others. Then when you disturb that colony the others do not know anything about it. Always smoke the hives at the entrance before disturbing them, for the first thing that happens when you touch a beehive is for the guards to rush out and discover the cause of the disturbance. Woe to the enemy then! But if they have been frightened with smoke, you can open the hive and continue with a slight amount of smoke without difficulty. Many of our most practical apiarists do not take the trouble of smoking at the entrance before opening the hive, but if you talk to them, they will acknowledge that they often have angry bees and that this is one of the reasons. We all make that mistake more or less and pay for it in stings.

Transferring—Packages—Nuclei, Etc.

I have four colonies in 10-frame hives, but the comb is crossways. I want to transfer these four colonies of bees into new hives

with frames of full sheets of foundation and give them new queens, also. The combs are about three years old, and the frames have never been taken out of them during the three years.

1. When do you think I ought to make this transfer? Could I do it this month yet, or wait till spring?

2. Is it simple to requeen bees?

3. When I make this transfer, would it be all right to feed this honey back to them, from the old frames?

4. I want to buy 25 3-lb packages of bees with queens next spring. Are 3 pounds of bees enough?

5. When would be the best time to have these bees shipped?

6. My neighbor was telling me bees from the South are not prolific in Wisconsin; they don't do well. Is that possible?

7. I am going to give them frames with full sheets of foundation. It that the proper way?

8. I noticed in the Journal some queens are as high as \$12 for breeders. What is the difference between these br s and queens they charge \$2 for?

9. What does "nuclei" mean? I noticed ads. in the Journal, from 1 to 5-frame nuclei for sale. Is that a colony of bees with combs full of brood or honey? I am a beginner, and am anxious to learn bee culture.

WISCONSIN.

Answers.—1. Transfer your bees in spring. It is the best time, because they are not so heavy in either brood or honey as they are at other times. Get a text book and follow instructions; it will pay you.

2. Requeening consists in finding the old queen and killing her; then introducing a young queen. It is not difficult and you can even do it with immovable combs or box hives, by driving the bees out, finding the queen among them and killing her.

3. Yes, it is all right to feed back what honey the colonies have at the time of transfer. They may need it.

4. Three pound packages make very good colonies if they are secured at the right time.

5. Have them shipped so they will reach you at the time of fruit bloom.

6. I don't believe your neighbor has had much experience with package bees. If they reach you in good order and you look after them and see that they do not suffer for want of something to eat, they will do well.

7. Yes, give them foundation and sufficient food, in case of bad weather or shortage of flowers.

8. The queens which are advertised as "breeders" at \$10 or \$12, are queens that have been tested as to the honey producing qualities of their bees and their own prolificness, and are among the very best in the apiary. They are worth considerably more than ordinary tested queens. But if you buy 15 or 20 untested queens from a breeder you may find one or two "breeders" among them, for they are usually young queens and have not yet shown what they can achieve.

9. Nucleus, nuclei, means one or more small colonies of bees; say two, three, or four combs with bees, brood, queen and some honey and pollen.

Be sure to get some book and read it. You will get several times the value of your money in information from it.

Keeping Honey—Why Bees Root

1. Will extracted honey keep best in fruit jars, air tight, or is it all right to keep it in 5-gallon crocks, just covered?

2. Why do bees gather in front of the hive and step back and forth, rubbing their noses on the board? When I lift up the cover I find them doing the same thing inside. They look like a bunch of hogs, all rooting.

NEBRASKA.

Answers.—1. Well ripened extracted honey will keep well in sealed jars. But it will also keep well in crocks or tanks, if these are

placed in a warm, dry room. Honey will be really benefited by evaporation, if the weather is hot.

2. In this case, Dr. Miller's reply, "I don't know," is well fitted. Perhaps the answer to this question has been found. If so, let us have it. Everybody is welcome to a guess.

Feeding for Winter

Please tell me how to prepare granulated sugar to feed my bees so it will not granulate in combs again. It has been so very hot and dry here it has burned up all bloom; will have to feed.

Answer.—Two pounds of granulated sugar for every pound of water, or 16 pounds of sugar for each gallon of water. Melt it thoroughly, then add about two pounds of good honey. This will prevent its crystallization. You may make it as heavy as 20 pounds of sugar to a gallon of water. If the bees take it slowly they can invert the sugar in their honey sacks, so there will be no need of honey. But when you feed fast they cannot keep up a sufficient amount of saliva to invert the sugar, hence the need of honey. This may be replaced by the addition of about a half ounce of tartaric acid to each gallon of liquid, which causes the same effect.

Honey From Poison Ivy

There is an impression here among our older residents that honey has at some time poisoned some member of their families by being gathered from poison ivy. As I am trying to build up an apiary here, I would like to be in position to refute such statements authoritatively. Will you therefore kindly advise me through the American Bee Journal as to whether poison ivy yields nectar, and, secondly, does such nectar (if any) necessarily poison the honey? Would poison ivy honey be dark, or light; bitter, or have any other distinctive taste? NEW HAMPSHIRE.

Answer.—Poison ivy (*Rhus Toxicodendron*) is reported in Pellett's "American Honey Plants," page 252, as secreting nectar. We are inclined to believe that this idea of its producing poisonous honey is simply an opinion which is not based upon facts. Some people can never eat honey of any kind without becoming sick. Their stomachs apparently do not assimilate it well. Of course, if any bees had been seen on poison ivy the tendency would be to charge it to the plant. Yet, the proportion of such honey in a crop would be so very insignificant that it would not be noticeable.

Feeding to Finish Sections

I have seven colonies of bees. I have supers on some. I would like your advice on the following:

Would it pay me to feed it at night time? The idea is for my bees to complete filling the capped sections with said honey. I can buy sweet clover honey for about 16c per pound. Can sell my capped sections for 30c per pound. Would the bees try to force it into brood frames and leave not enough room for queen to deposit eggs? NEW YORK.

Answer.—For completing sections which are already partly filled, it may pay you to buy honey at 16 cents, if you can sell sections at 30 cents. But you may count upon the bees using a good portion of that honey to breed, and also to build comb; so that you will not find it very profitable. Just how much is a question which we cannot settle any better than the question of how much it will pay you to feed a certain amount of corn to finish fattening your hogs. The result is not always the same.

Fumigating Comb Honey

1. What is the best for fumigating section honey?

2. How much should be used for a given

number of supers filled with comb honey?

3. How often should comb honey be fumigated? NEBRASKA.

Answers.—1. You may use burning sulphur or bisulphide of carbon.

2. Prof. Paddock recommends one quarter ounce of sulphur burned under a pile of supers, for every cubic foot of space. That is plenty. Be sure and have a few empty supers between the burning sulphur and the combs, so the sulphur will not melt the combs. The sulphur is usually sold in "wicks" by druggists, and burned in a metal dish. The bisulphide of carbon, poured over the combs or soaked into a cloth, may be used in quantities of one-eighth ounce per cubic foot. It is inflammable and a light should not be brought near. As it is heavier than air, it should be put at the top of the pile.

3. In ordinary circumstances two fumigations, about two weeks apart, should do the work. The second fumigation is for eggs which are not yet hatched at the time of the first fumigation. Of course, the combs should be kept in a closed room where the moths can have no further access to them.

Winter Packing

How would it do to pack winter cases of bees with pine needles? We have plenty of them and during the winter we frequently have periods of three weeks that it is 25 degrees below zero. NEW HAMPSHIRE.

Answer.—Pine needles would probably be very good. I do not believe that this packing has ever yet been suggested in the Journal. Try them and report how you succeed.

ODDS AND ENDS

The Right Spirit

I wish to add a little towards the memorial for Doctor C. C. Miller. I deeply regret that I never had the opportunity of meeting him personally, but yet I think of him as a friend. One seemed to become acquainted with him through his writings.

I am sorry that I cannot do more. I am a boy 19 years of age, attending the University of Wisconsin. I find that it is a great deal easier to write out checks while at school than it is to make deposits.

So, with best wishes, I send this remittance from a small beekeeper with a large amount of enthusiasm for the remembrance of a large beekeeper with a large amount of enthusiasm.

Walter A. Kuenzli,
Wauwatosa, Wis.

Annual Sweet Clover Coming

Annual white sweet clover, generally known as Hubam sweet clover, will soon be available to everyone.

News comes of a farmer in Clark County, Ohio, who sowed 80 acres to this crop in the spring on his farm near Springfield. Mr. James Kitchen, the farmer, expects to raise the crop for seed.

One Reason Why Honey is Low

We try to sell our extracted honey too rapidly. It will keep. People eat it the year round and buy it every week of the 52. We are foolish to try and force its sale all in the six weeks it is produced. Do not be in a hurry to sell your extracted

honey. Demand will certainly be much better in the fall and prices need not be lower. In fact, they may be somewhat higher as soon as the timid ones who seem to be afraid it will evaporate or fly away, have sold out.

Remember that extracted honey will keep— and keep it.—Texas Honey Producers' Bulletin.

An Interesting Experiment

A letter from C. G. Golding, of Hankow, China, conveys the information that a queen mailed from California by P. C. Chadwick, reached China alive after spending 47 days in the mails. This is perhaps a record for safe arrival after long confinement. In most cases queens mailed from Europe to America have been dead on arrival the past summer, although the time spent in the mails has been much shorter.

Maine Holds Summer Meetings

Three summer meetings were held in Maine during the month of August. The first was at Portland on the 15th, the next at Lewiston on the 16th, and the last at Bangor on the 17th. The President, Lester W. Longfellow, and Secretary F. L. Mason, and Frank C. Pellett, spoke at all three of these meetings. At Portland, State Horticulturist Frank H. Dudley gave an address outlining the policy of his department to lend all possible aid in extending the work of the beekeepers' organization. Dr. Talbot gave an interesting account of his experience with bee-stings as a cure for gout. A local physician then outlined his methods of beekeeping in the city. At Lewiston Mr. Malloon talked on beekeeping along with farming.

The Maine Association was only organized last February, and the interest in this first series of summer meetings augurs well for the future success of the organization.

The New York Summer Series

The beekeepers of New York State held a series of meetings during the summer. The Western New York Honey Producers' picnic at LaSalle, on July 30, was attended by about 150 enthusiastic beekeepers. The apiary of Edwin DeVentier furnished an ideal place for the meeting. In addition to the usual program of addresses much time was taken up in discussion of the honey crop, prices and markets.

The State meeting was held at the Alexander apiary at Delanson, on August 5. There was a large attendance and an extended program. Allen Latham, of Connecticut, was the principal speaker. Much interest was manifested in the apiary, which is so well known to beekeepers everywhere.

The Northern New York Honey Producers met at Campbell's Point, near Sacket's Harbor, on August 11. Here again there was an attendance of about 150 persons, with a full program and a lively discussion.

In addition to the above principal meetings there were a number of county picnics, some of which were

well attended in spite of heavy rains, which made it necessary to carry out the programs within doors. The associate editor of this Journal greatly enjoyed the opportunity to accompany George H. Rea, beekeeping specialist of New York College of Agriculture around the circle of this series.

New Hampshire Meeting

The New Hampshire beekeepers had a very successful meeting at the Agricultural College at Durham, on August 17 and 18. Allen Latham, of Connecticut, was the principal speaker on the first day and greatly interested his audience with a demonstration of requeening, along with a discussion of the subject of queen rearing and introduction.

On the second day Frank C. Pellett spoke on the subject of "Locality," discussing the factors that influence the honey flow.

League Notices

Announcement was made in last month's papers that the League had ready for distribution the notices offering a reward for the arrest and conviction of anyone disturbing the apiary at which this notice was placed. Quite a number of the League members have taken advantage of this, but it is desired that more members secure these cards. Any beekeeper belonging to an association affiliated with the League in any manner has the right to the use of these notices and can secure them at the cost of printing from the Secretary.

The first of the series of the League advertisements appeared in the September number of "Good Housekeeping." It will be found on page 141. It is, of course, hard to estimate the value of an advertisement, but if the ad sells honey in proportion to the requests that it is bringing for the recipe booklet, it is going to be a great success. The Secretary is receiving large numbers of these requests, coming from every part of the United States. This advertising is being backed up by a circular of information to the wholesale grocers of the United States and by reading articles on the use of honey and concerning honeybees in the principal home magazines.

The Legal Department of the League has been extremely successful in helping out a considerable number of our beekeepers who were unfortunate enough to live in cities and villages where moves were made to pass ordinances prohibiting the keeping of bees. Letters from the Secretary, the Legal Advisor and other men prominent in the League were written in every case reported, and in a number of instances the Secretary was notified that all legal proceedings had been abandoned on account of the information sent by the League.

Prof. H. F. Wilson, of the Schedule Committee, has just completed arrangements whereby the majority of the speakers visiting State Beekeep-

ers' Associations have agreed to make only those Associations which take the dates appointed by the League Schedule. While this seems to be somewhat of a radical move, it is for the best to all concerned, as it makes the travel and expense of the speakers much less and enables the States to secure speakers whom they get not otherwise interested in their meetings. It is to be hoped before another year passes that there can be added to the schedule the names of the members who will make the territories indicated on the schedule.

The Kansas Honey Producers' League has completed its affiliation with the American League. The Kansas League is composed of a small number of men who are very active and progressive in beekeeping affairs, and their guiding spirit is the League's well-known friend, Dr. J. H. Merrill.

The Secretary of the League and the advertising manager are supplying every magazine or paper that will appreciate them, articles on the use of honey, and any magazine which would like one or more of these articles can obtain them by application to the Secretary. These articles are written in popular style and contain no advertising material whatever and make a welcomed variation to the ordinary recipe article.

The Bureau of Markets of the United States Department of Agriculture already sees the value of the American Honey Producers' League. In the August 20th number of the Market Reporter occurs the following paragraph:

"The American Honey Producers' League, which is a super organization of the beekeepers' associations of the country, has outlined plans for an increased advertising program during the fall and winter, and considering the fruit shortage, honey may move at better prices by winter."

The peculiar financial condition of the country and the fact that the total honey crop will be small this year, works a hardship on the beekeepers, but it is one of the factors which are going to help the League to its rightful position. If the League had the support of every beekeeper in the United States, the League would be able to advance money on honey deposited in warehouses so such a thing as 4 to 8 cent honey would be unknown. The success of other co-operative associations shows that this can be accomplished.

H. B. Parks, Secretary.

Pollen-Clogged Combs

Some time ago an article appeared in the Journal explaining how pollen-clogged combs could be scraped part way down to the mid rib, and returned to the bees, during a honey flow, and taken from them again in a few days, cleaned up in good shape. This article was written by Elvin M. Cole, of Audubon, Iowa, and I believe the plan is original with him, and should be impressed upon the

minds of beekeepers, as thousands of good worker combs can be saved by using the method described by Mr. Cole. I had about eighty pollen-clogged combs carried over from last year, which were treated by Mr. Cole's method, and all of them are good worker combs today. Two of these combs were placed in the center of the broodnest of two different colonies, after the cells had been broken down and the pollen disarranged, and 72 hours later they were practically cleaned of pollen and drawn to their natural size again, with both queens laying in the treated combs.

J. G. Prosser,
Ft. Dodge, Iowa.

Illinois-Wisconsin Meet

The annual meeting of the Northern Illinois and Southern Wisconsin Beekeepers' Association will be held in Memorial Hall, Rockford, Ill., on Tuesday, October 18, 1921. We would be pleased to have samples of comb and extracted honey, also anything new in line of bee supplies.

B. Kennedy, Secretary.

Hubam Annual Sweet Clover

Last February I bought 4 ounces of the new Hubam annual sweet clover seed at \$1.50. On April 2 I planted the seed in drill rows 35 inches apart and it made 5 rows 75 feet long, but I got it too thick and could easily have gotten 10 rows from the 4 ounces of seed.

It started to bloom on July 2, and is 3 to 5½ feet high and is full of bees from daylight till dark, and some of the seed will do to pick the last of this coming week.

I have this patch on sandy soil, such as is suitable for melons, sweet potatoes, and rye, and I never saw its equal. I expect to get at least 10 pounds of seed from the 5 rows, and I honestly believe that this new clover will verily make this old U. S. A. a land flowing with milk and honey.

I expect to seed one acre in drill rows next spring and try and not get it so thick as this year.

Up to June 15 this year was the worst I ever experienced, and I fed 170 colonies 3,500 pounds of sugar, but they have made a living and stored about 25 to 30 pounds of surplus honey per colony since June 15, and prospects are real good for a fall flow, and heartsease is starting to bloom now, August, 1921.

Fred H. May, Meredosia, Ill.

Bees at Wisconsin University

The beekeeping work is now thoroughly organized at the Wisconsin State University. A full two-year course and a full four-year course in beekeeping will be offered. Prof. H. F. Wilson is in charge of the work, with V. G. Milum as apiarist. L. P. Whitehead will devote his full time to extension work in beekeeping.

Hambleton to Washington

J. I. Hambleton has recently resigned his position in the University of Wisconsin to accept a position as assistant apiculturist in the U. S. Department of Agriculture.

The Large Hives are Producers

My white clover crop is about in. My old Dadant hives are the ones that did the big business, as you predicted. I have taken 170 pounds of extracted from my best and 160 pounds from the next. Besides, 30 new combs were drawn in the first, and 13 extracting and 3 brood combs were drawn in the other. Our location is not the best, and the results this year are good.

Elmer T. Beach,
Kalamazoo, Mich.

Profit in Beekeeping

A 24-page booklet with the above title has just been issued by the G. B. Lewis Company. It is intended primarily for the beginning beekeeper, to give him ideas as to the proper way to begin beekeeping to insure the most satisfactory results.

The booklet sells for 10 cents.

Second Crop Dandelion

There is a large crop of Dandelion in bloom in this vicinity at this time (August 15), and the bees are visiting it, for both nectar and pollen. It is, I believe, the first time that a second crop of this plant has ever been known in this State.

A. F. Bonney, Iowa.

Honey Week in Georgia

According to Georgia newspapers, the Governor of that State has been asked to designate the week of November 6 to 12 as honey week. During that time it is proposed to conduct a state-wide campaign to advertise honey and to make sure that it is offered at every hotel, restaurant and grocery store in Georgia.

Cuba Objects to Tariff

A press dispatch states that a representative of the Cuban government has filed a special objection to the proposed tariff on honey provided by the Fordney bill now under consideration in Congress. Other items objected to are the tariffs on sugar, leaf tobacco and pineapples.

Montana Bee Inspector

B. J. Kleinhesselink, of Haddin, has been appointed State Bee Inspector of Montana. The newly appointed officer is a well-known beekeeper of long experience.

Minneapolis Also

Newspaper reports indicate that the city of Minneapolis is one of the latest to make the attempt to banish bees. It is proposed to pass an ordinance to prohibit the keeping of bees within certain districts.

New Man for Massachusetts

The beekeeping work at the Massachusetts College of Agriculture has recently been resumed with Norman Phillips in charge. The course in beekeeping has been suspended for some time past, since the resignation of Dr. Burton N. Gates, who was in charge for a number of years.

Bees Take Possession

Some amusing incidents as a result of stray swarms of bees are going the rounds of the press. In one case

a lady returned home to find that a swarm had taken possession of her cellar. First she called the police, but they decided that there was nothing they could do to assist her. Her next move was to demand assistance from the Board of Health, with similar results.

At another place a swarm has taken possession of the school house and the authorities are much worried about the possibilities, since when it was time for school to convene there seemed to be no way to rid the premises of the bees.

Perhaps the most unusual is the case where a large tree fell across the road. Within the hollow of the tree was a swarm of bees. When the tree fell it was broken open and the honey scattered about. The road was soon swarming with bees to such an extent that it became necessary to close the road and warn travelers to detour by another way.

Killed by Sting

L. E. Arensen, a mail carrier at Grandview, Washington, was stung by a bee while on his route and died within twenty minutes. He was unconscious when the doctor reached him and could not be revived.

Toledo Next

Now comes the report that Toledo, Ohio, has under consideration an ordinance which will make it unlawful to keep bees, cows, ducks or geese within the limits of that city, without a permit from the Board of Health. It seems to be a popular pastime for city aldermen to legislate against the bees.

A Strange Case

A Milwaukee paper says that "The honey crop is hindered by the nectar flow." What do you think of that?

TRANSFER OF EGGS BY BEES

It would seem that repeated, well-authenticated instances should in due time establish a precedent or a fact. Also, here is an instance where "it was the unexpected that happened."

On last Saturday (April 2), I discovered a colony to be hopelessly queenless. I had previously seen the queen on one of those unseasonably warm days about two weeks before. However, the queen had been gone long enough that there was positively no brood in the hive, nor eggs; so, in order to forestall laying workers, and keep the bees contented, I gave a frame of brood and eggs from another colony. Three or four days later I looked in and found two rather small queen-cells (joined) started on the comb facing the comb of brood—and in one of the cells there was an egg! There was no jelly about the egg, nor in the cell. The egg could not have been in the cell any length of time, judging by all appearances.

So here is a plain case where the bees must have transferred an egg as there is certainly no other explanation for the presence of the egg in that cell cup, the cell cup having just been built from "whole cloth" upon a comb which had been in the

hive all winter, and having just prior to this occurrence, no sign of brood or eggs in it.

The bees, having unquestionably transferred an egg in this instance, it is reasonable and proper to believe that bees have done the same thing before, and are likely to do the same thing again.

As previously stated, the frame of brood was given solely to forestall laying workers, and to keep the bees contented; it is too early to think of getting a queen fertilized, or even of raising a respectable queen. There are no drones ready, as yet, to fly.

By the time a queen may be hatched, the season will be further advanced, and I shall hope the weather may be more favorable and dependable—and it may be possible then to find a queen cell in some other hive, to be transferred to this colony for another chance. The present price for a queen at this date is prohibitive.

D. Queen.

New Jersey.

(We have seen instances similar to this. But in each case, the egg thus apparently transported turned out to be a drone which died in the queen-cell, as happens when they try to rear a queen from a drone egg. The explanation of this happening is to be found in Wagner's "Dzierzon Theory," published on page 5 of the first volume of the American Bee Journal, January, 1861. Mr. Wagner wrote:

"So long as a fertile queen is present in the hive, the bees do not tolerate a fertile worker. Nor do they tolerate one while cherishing a hope of being able to rear a queen. In rare instances, however, exceptional cases occur. Fertile workers are sometimes found in hives, immediately after the death of the queen; and even in the presence of a young queen, so long as she has not herself become fertile."

It is true that, in the instance of which we speak, the bees had been broodless, and that they surely ought to have had some brood there, if a fertile worker was there. But there appears to be a tendency, on the part of some workers, to lay a few eggs at the time when their comrades are making efforts to build queen-cells. Instances of workers laying a few eggs, at the time of queen-rearing, in a queenless colony, are perhaps more frequent than is generally believed. The main argument in favor of the famous Dickel theory, which held that bees could change the sex of the larvae, by the change of food, was based upon the fact that sometimes drones are reared around a queen-cell, when that cell has been built by tearing down some worker cells containing young brood. These drone eggs are undoubtedly due to some over-zealous worker which finds herself able to lay an egg or two, and thinks she may help matters along by so doing.

Later information from our friend above is to the effect that the egg in that cell has disappeared and that well formed and sealed queen-cells are on the brood-comb furnished by him. This is in the line of our expectations in this occurrence.—Ed.)

SOME APIARY NOTES

The usual plan of uniting with a weak colony set on top of a strong one, with a newspaper between, proved a failure with me. About a quart of the bees were found dead outside before I discovered my misplaced confidence and reversed the chambers with a wire screen between them over night. The stronger colony confined up stairs soon loses its fighting instinct and the weaker colony on a strange stand likewise. This is the nearest 100 per cent method which I have tried.

Robbing

To stop robbing, coal oil is the surest remedy I have found. Just smear it all over the cracks they try to enter and reduce the entrance to a small space. The oil should be smeared on both sides and above the entrance as well as alighting board and entrance blocks. The robbers soon forget what they came after. So far this has been 100 per cent successful with me.

Large Hives

My experience with the large hives as compared to the standard is decidedly in favor of the Dadant or Jumbo depth, and ten-frame width. I only use 8 frames in a ten-frame super, which gives thicker combs with less uncapping.

N. A. Clay, Oberlin, Ohio.

New Hampshire

The New Hampshire Extension Service publishes Bulletin No. 15 on "Beekeeping for New Hampshire," written by Wm. H. Wolff. It is a 16-page Bulletin giving excellent elementary information on the subject, with several good cuts. Address the New Hampshire College of Agriculture.

Connecticut Bees Registered

Attention has recently been called to the fact that Connecticut has a provision which requires every owner of bees to apply to the town clerk for a certificate of registration. A fee of 25 cents is required for registration. A fine is provided for those who neglect to take out the required license.

Bees Cause Wreck

Several accidents of similar nature have been reported from different sections. In each case the driver of an automobile has been stung or frightened by a bee, with the result that the machine has gone into the ditch. While the details are varied somewhat according to circumstances, the newspaper reports of those accidents are very much alike.

A Progressive Illinois County

Henry County, Illinois, is leading the way in organization in Illinois counties. Field meetings were held in June and September and they expect to supplement these with indoor meetings during the winter.

York Honey Store

Our readers who knew George W. York in years past will be interested in hearing that he has returned to

the business of packing and selling honey. A store has been opened at 30 West Main Ave., Spokane, and the business will be conducted under the name of York Honey Company.

Hawaii Wants Honey Plants

A Hawaiian enthusiast recently visited California to secure some of the more important honey plants, including sage, for introduction into the Islands. There are some very large apiaries there and some of the more important sources upon which the beekeepers now depend have been introduced from the mainland.

Honey in a Thresher

A newspaper clipping states that Zena Briggs, of Hancock, Iowa, found his threshing machine occupied by a big swarm of bees when he prepared to get ready to open the last threshing season. Briggs took more than 600 pounds of honey from the machine, according to the newspaper story, and so gummed the outfit up with honey and wax that he found it difficult to get it ready for operation.

Worker Mates With Drone

H. O. Hutton, of Arlington, Wash., reports that on one occasion he observed a worker bee mating with a drone and enquires whether this has often been known. He states that he examined the insects carefully so that no mistake was made. He is familiar with the fact that occasionally queens are very small, but in this instance the female was plainly a worker bee.

This is certainly not a common occurrence, and we will be glad to hear from any of our readers who have made a similar observation.

The Honey Book

The Texas Honey Producers' Association has issued an attractive little book of recipes with title "The Honey Book." It contains 32 pages and cover and is designed to suggest numerous ways in which the housewife can utilize honey for her table. H. B. Parks had its preparation in charge and we anticipate that it will prove to be a piece of effective advertising for the Association.

A New Way to Dislodge the Bees

A painter at Peekskill, N. Y., recently found a colony of bees in the cornice of the roof. In an effort to dislodge them he applied a torch to the crevice which served as a flight hole, and set the house on fire. Prompt arrival of the fire department saved the building from destruction. Since we frequently receive letters asking how bees can be removed from houses we pass on the New York plan—burn the house.

More Spray Poisoning

For some time beekeepers have been complaining of the loss of bees through the spraying of fruit trees. Now complaints are beginning to be heard from the South, where cotton fields are sprayed in an attempt to control the boll weevil. Where cal-

cium arsenate has been dusted on the plants as recommended by the U. S. Department of Agriculture, no damage seems to have been done to the bees, but where the liquid sprays have been used the bees are reported killed in large numbers.

A Remedy for Bee Stings ✓

If you are stung on the hand, at once put the place to your mouth and suck it vigorously, at the same time scraping it with your teeth. You can often suck out enough of the poison to taste it distinctly, but it is perfectly harmless in the mouth, though, of course, you would prefer to spit it out. With so much of the poison removed, the result of the sting is bound to be that much less.

Of course, if you are stung on the face, you cannot apply this remedy, but if you have a companion with you he will do it for you, especially if you are a pretty girl and he is sufficiently chivalrous.

Dr. A. A. Ames,
Missouri.

Harrison County Association

The beekeepers of Harrison County have been recently organized, the Association having held its midsummer meeting and picnic at the large apiary of George Young, near Woodbine. F. B. Paddock, of Ames, State Apiarist; M. H. Pelton, of Woodbine; Mrs. Marvin, of Logan, and C. R. Smith, spoke. County Agent C. R. Fritzsche was in charge. While the social phase of this meeting was worth all our effort, the value of instruction received could hardly be estimated.

C. R. Smith,
Secretary-Treasurer.

Hard Luck

"Sweetenin'" sometimes comes hard in Missouri. Says the Greenfield Vendette: "Uncle Jim Morris reports that one day last week, at noon, while he had his shoes off and was resting his feet, a swarm of bees came along. He never took time to put his shoes back on, but just grabbed the good wife's washtub and a plow handle and took after them, making as fine music as a bee ever heard. After running them about a mile and knocking a toenail off, he treed them in a big oak tree. He says it took him two hours in the hot sun to cut the tree and get the hive—and then the dadgum things came out the next day and left. He says honey is not very good this year anyway."—Kansas City Times.

Bologna Association

A beekeepers' association has lately been organized in the Province of Bologna, Italy, under the name of "Associazione Provinciale Apicoltori Bolognesi." One of the most important purposes of this organization is "to regulate the work of the individual apiaries for the preservation of the purity of the Italian bee, its improvement and its defense against the propagation of contagious diseases." Bologna is in the heart of Italy and has very fine bees.

CLASSIFIED DEPARTMENT

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 20th of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

BEES AND QUEENS

ATWATER HONEY—Supply your customers.

FOR SALE—Black bees—Three pounds, \$5.00, parcel post prepaid. Add price of queen wanted. Pure black queens, 60c each; hybrid 40c; tested Italian, \$1.25. Safe delivery guaranteed. One-fourth down. Write me. Carl L. Wilson Apiaries, Mount Vernon, Ga.

BEES in 2-pound packages, our specialty for 1922. Now booking orders. See ad elsewhere for prices. Caney Valley Apiaries, J. D. Yancey, Mgr., Bay City, Texas.

QUEENS OF QUALITY for 1922—3-banded Italians only. After April 15, untested, \$1.25; tested, \$2. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

WE are now booking orders for spring delivery of our queens and package bees. Write us for prices. Graydon Bros., Rt. 4, Greenville, Ala.

1922 PACKAGE BEES and **QUEENS**—Untested and day-old, in Thompson safety introducing cages. Discounts on early advance orders. James McKee, Riverside, Cal.

QUEENS, package bees and nuclei. Begin shipping March 15, 1922. Circulars free. Booking orders now. Dr. White Bee Co., Sandia, Texas.

FOR SALE—300 colonies bees in 8-frame hives; also a lot of supers, combs, and bee shipping cages. Locations go with bees if wanted. Priced right. C. H. Cobb, Belleville, Ark.

SELECT QUEENS—Choice three-band Italians, tested, \$2.50; untested, \$1.25. Also a few Carniolans, same price. Geo. W. Coltrin & Son, Mathis, Texas.

WILL SELL 100 colonies bees with the best location in the State; equipped for extracting. This is one of the very best apiaries to be found; no queen over two months old; all Italian queens; 100 queen mating hives go with apiary if wanted. This is a fine location for a queen breeder and package man to locate. This outfit is not for sale cheap, but will sell for what it is worth. If you don't want to pay for price for a good thing, do not answer this ad. J. B. Douglas, Rt. 2, Box 209, Tucson, Ariz.

FOR SALE—30 colonies Italian bees, new 10-frame hives, wired; full sheet foundation, in lots to suit, \$10 each. Henry C. Klaffenbach, Muscatine, Iowa.

I AM BOOKING ORDERS for 1922 package bees; 2-lb packages, \$3.75, no queen. No disease. Send order with 10 per cent. D. W. Howell, Shellman, Ga.

FOR SALE—200 colonies of bees in 10-frame double-walled hives; 400 supers, extracting combs, extractor, etc.; a real bargain, and one of the best kept apiaries in the State. Everything in first-class shape. Must all be sold in one bunch. G. H. Creech, Central City, Neb.

FOR SPRING DELIVERY, 1922—One vigorous Italian queen, one frame emerging brood, one pound bees. Price, complete, f. o. b. Bordelonville, \$5. Additional frames of brood, each \$1; additional pounds of bees, each \$1. Queen introduced and laying enroute to you. Safe delivery and satisfaction guaranteed. No disease. Reference given. Orders booked one-fifth down, May delivery. Send for addresses of satisfied customers. Jes Dalton, Bordelonville, La.

SWARTS' golden queens produce golden bees of highest quality. Untested, \$1.25 each; 6 for \$7; tested \$3. Satisfaction guaranteed. D. L. Swarts, Lancaster, Ohio. Rt. 2.

ACHORD'S ITALIAN QUEENS are just a bit better than the best of the rest. We can send them by return mail. Three-banded Italians only. Large, vigorous, gentle. Guaranteed to give you satisfaction. Untested, \$1 each; 6, \$5.50; 12, \$10.50; 25, \$20; 50, \$33. Tested queens, \$1.75 each. W. D. Achord, Fitzpatrick, Ala.

BEES—100 colonies for sale. E. F. Atwater, Meridian, Idaho.

FOR SALE—50 colonies bees in 8-frame, 3-story hives; also 50 colonies in 10-frame hives; will sell all or part. James A. Dillon, Box 15, Thornton, Calif.

SPECIAL FOR OCTOBER, ITALIAN BEES \$1 a pound. Write for terms and particulars. May delivery. Satisfaction and safe arrival guaranteed; also booking orders for nuclei. Select leather queens, October, 90c. Tupelo Honey Co., Columbia, Ala.

NUCLEI for 1922 delivery—3-frame black or hybrid bees, Italian queen, \$5; 3-frame Italian bees and queen, \$5.50; 3-frame black bees and queen, \$4; 3 lbs. black bees and Italian queen on comb of honey, \$5.50. Cypress hives complete; five 10-frame, \$12. Full depth supers complete, five 10-frame, \$7. Prices on other sizes upon request. I own the timber and manufacture the hives, with no middlemen involved. Book orders now, so you can name shipping date to suit yourself. One-third with order to guarantee acceptance. Reference: Toombs County Bank, Lyons, Ga. Good farm for sale cheap; 660 acres. Terms to suit purchaser. Otto Diestel, Elza, Ga.

FOR SALE—400 stands clean bees, extracting equipment; good location; for season write. The Oregon Apiary Co., Nyssa, Oregon.

WE BELIEVE we have the best Italian queens obtainable. Our new system is working wonders. Untested, \$1.25; tested, \$2.25; virgins, 50c. Am booking orders for 1922. F. M. Russell, Roxbury, Ohio.

FOR SALE—Three-banded Italian queens, untested, \$1.25 each; 6, \$7.50; 12, \$14. Tested queens, \$2.50 each; 6, \$15. The above queens are select stock. Safe arrival and satisfaction guaranteed. Rob't B. Spicer, Wharton, N. J.

HARDY ITALIAN QUEENS, \$1 each. W. G. Lauver, Middletown, Pa.

FOR SALE—Hardy northern bred Italian queens and bees, each and every queen warranted satisfactory. For prices and further information write for circular. H. G. Quirin, Bellevue, Ohio.

BEES AND QUEENS from my Carolina apiaries, progeny of my famous Porto Rican pedigreed breeding stock. Elton Warner, Asheville, N. C.

FOR SALE—Leather colored Italian queens, tested, until June 1, \$2.50; after, \$3. Untested, \$1.25; 12, \$13. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

FOR SALE—Root's strain of golden and leather-colored Italian queens; bees by the pound and nuclei. Untested queens, \$1.50 each; select untested, \$2 each; tested, \$2.50 each; select tested, \$3 each. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

WE are booking orders for our golden Italian queens for spring delivery after April 15. Untested queens, 1, \$1.50; doz., \$15; select untested queens, 1, \$1.75; doz., \$18; virgin queens, 1, 75c; doz., \$9; tested queens, 1, \$3; doz., \$36. Safe arrival guaranteed. Tillery Brothers, Georgiana, Ala.

BOOK YOUR ORDERS for **QUEENS** now—Goldens, \$2; tested, \$3; banded, \$1.50; tested \$2.50; six or more, 10 per cent less. Clover Leaf Apiaries, Wahoo, Neb.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook, 14tf 84 Cortland St., New York City.

FOR SALE—Golden Italian queens, untested, 1, \$1.25; 6, \$7. E. A. Simmons, Greenville, Ala.

FOR SALE—Burleson's three-banded Italian queens. The kind of bees that get the goods. Guaranteed to please or money back. For balance of season as follows: 1 select untested queen, \$1.25, 6 for \$7, 12 for \$13.50, 100 or more \$1 each. Send all orders, together with remittance, to J. W. Seay, manager, Mathis, Texas. T. W. Burleson, Waxahachie, Texas.

WANTED—We have many calls from educators for copies to complete their files of the older Bee Journals. If you have complete volumes or miscellaneous numbers of any Bee Journals previous to 1900, write us, giving a list, and we will be glad to quote a price. Old bee books, now out of print, are also desirable. We act as a clearing house for this kind of materials. American Bee Journal, Hamilton, Ill.

BEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

WE are now equipped to handle your early spring orders for package bees and queens, especially bred for the production of honey. Our queens are bred from the best stock obtainable, and will give satisfaction. Safe arrival guaranteed. Write for prices and terms. Sarasota Bee Co., Sarasota, Fla.

CALIFORNIA ITALIAN QUEENS at special prices. After June 15 and to October 1, 1, \$1.25; 6, \$7; 12, \$13; 25 and over, \$1 each; 100, \$90. See larger ad elsewhere. Circular free. J. E. Wing, 155 Schiele Ave., San Jose, Cal.

NUCLEI—We make a specialty of shipping 2-frame nuclei. Write for special prices for June delivery. Queens at the following prices: Untested, \$1.50 each; 6, \$8; 12, \$15; 50, \$60; 100, \$100. Tested queens, \$2.50 each. Cotton Belt Apiaries, Roxton, Texas.

LARGE, HARDY, PROLIFIC QUEENS—Three-band Italians and goldens, pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness and color. After June 1, untested queens \$1.50 each, 6 for \$8, 12 or more \$1.40 each, 25 or more \$1.25 each. Tested queens \$3 each, 6 for \$16. Buckeye Bee Co., Justus, O.

SWEET CLOVER SEED

FOR SALE—A limited quantity of my crop of Giant Annual white sweet clover seed of the Hughes variety. This seed was all produced under cultivation. References and prices furnished upon application. Get your supply before I am all sold out. Edw. A. Winkler, Joliet, Ill., Rt. 1.

HONEY AND BEESWAX

ATWATER HONEY—Supply your customers.

FOR SALE—New crop choice clover extracted honey, packed in new cans and cases, at \$14.85 per case of two 60-lb. cans. A few cases of last year's clover honey at 10c. Write for price on ten or more cases of new honey. J. D. Beals, Oto, Iowa.

MR. BOTTLER, supply your trade with the best, several tons finest extracted honey ready to ship at your command. Bee-dell Apiaries, Earlville, N. Y.

FOR SALE—Twelve cases of off-grade extracted honey. Fine for baking; \$10 per case of two 60-lb. cans. Sample 20c. J. D. Beals, Oto, Iowa.

FOR SALE—Extra fancy white clover honey, well ripened and put up in new cans, 60-lbs net; per case of two cans, \$16. Write for special price on larger quantities. Edw. A. Winkler, Rt. 1, Joliet, Ill.

FOR SALE—Extra fine white clover honey, in new 60-lb. cans, two to the case, at \$15, f. o. b. Ruthven, Iowa. Martin Carsmoe.

FOR SALE—Amber honey in 60-lb. cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—Finest clover honey, packed in new 60-lb. cans and 5-lb pails. Sample 15c. A. C. Ames, Weston, Ohio.

QUICK CASH for comb and extracted. Bruner, 3836 N. Kostner Ave., Chicago, Ill.

HONEY—SUPPLY YOUR CUSTOMERS—Finest alfalfa-clover honey, extra strong cases, case of two 5-gal. cans, \$12; case of six 10-lb. pails, \$7.20; case of twelve 5-lb. pails, \$7.80, all f. o. b. here. E. F. Atwater, Meridian, Idaho.

FOR SALE—No. 1 white comb, \$6 per case; No. 2 white comb, \$5 per case of 24 sections; six cases to carrier. Clover extracted, in two 60-lb. cans to case, 15c per pound; 5-lb. pails, \$1 each, 12 to case. Amber baking honey, two sixty-lb. cans to case, 10c per pound; same honey in 50-gallon barrels. H. G. Quirin, Bellevue, Ohio.

EXTRA FINE white sweet clover honey, new crop, in 5-gallon cans, cases of 2 cans, \$15; 1 can, \$8. Write for prices on a ton or a car load. Sample 10c. C. S. Engle, 200 Center St., Sioux City, Iowa.

FOR SALE—New crop sweet clover honey in 5-lb. pails, 12 to case, 15c per lb.; 60-lb. cans, two to case, 12½c per lb.

J. P. Goodwin, South Sioux City, Neb.

FOR SALE—Extra choice extracted white clover honey, put up in 60-lb. cans and 5-lb. lithographed pails. Sample 20c, same to apply on first order.

E. J. Stahlman, Grover Hill, Ohio.

FOR SALE—Extra fine Michigan white clover and basswood honey. Almost water white; indeed, I doubt if the color, body and flavor can be beaten. Put up in 60-lb. cans, 2 to the case, at 15c per pound, or in 5-pound pails, 50 to the barrel, at 17c per pound. Sample 15c.

O. H. Schmidt, Rt. 5, Bay City, Mich.

HONEY FOR SALE—In 60-lb. tins, water white orange, 14c; water white sweet clover, 12c; extra light amber sa.c., 11c; New York State buckwheat, 10c, for immediate shipment, from New York. Hoffman & Hauck, Inc., Woodlaven N. Y.

FOR SALE—Finest Michigan raspberry, basswood and clover No. 2 white comb, \$5.50 per case; No. 1, \$6; fancy, \$6.50; extra fancy, \$7. 24 Danz. sections to case. Extracted, 60-lb. cans 15c per lb. W. A. Latshaw, Clarion, Mich.

FOR SALE—Extracted honey. Write for prices. A. L. Kildow, Putnam, Ill.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co., 204 Walnut St., Cincinnati, Ohio.

Extracted and comb honey wanted. Quote lowest price and how packed.

P. H. OUTZEN

White Bear Lake, Minn.

HONEY WANTED—Give particulars in first letter. Elton Warner, Asheville, N. C.

SUPPLIES

ATWATER HONEY—Supply your customers.

FOR SALE—Western beehives, standard sizes, manufactured from red cedar and white pine; odd sizes made to order. Williams Bros., 5125 82nd St., S. E. Portland, Ore.

WESTERN BEEKEEPERS—We can demonstrate that you can save money on buying bee supplies of best quality. Write for our latest price list.

The Colorado Honey Producers' Association, Denver, Colo.

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list.

American Bee Journal, Hamilton, Ill.

FOR SALE

ATWATER HONEY—Supply your customers.

FOR SALE—20 colonies Italian bees, 1 Cowan reversible extractor, 200 quarts clover honey. Bargain for a quick sale. Write for particulars. D. Milligan, 603 Cambridge St., Kewanee, Ill.

FOR SALE—Back numbers of Gleanings 13 years, Journal 2 years, Miller's Thousand Questions, Hutchinson's Adv. Bee Culture, Alley traps, 10-frame 7-wire excluders. Write for bargain prices.

W. H. Keller, Emporia, Kans.

FOR SALE—1½ horse power gasoline engine; first-class working condition Price \$25. Paul D. Roban, Waverly, Minn.

FOR SALE—350 colonies fine strain Italian bees in first-class condition. All colonies well provided with honey. Will sell cheap. Write for particulars.

Chas. Heim & Sons, Three Rivers, Texas.

FOR SALE—40 colonies of bees in standard dovetailed hives, with wired frames. Bees healthy. Write for particulars.

Duane Shaw, Palestine, Ill.

FOR SALE—Cedar or pine dovetailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.

A. E. Burdick, Sunnyside, Wash.

FOR SALE—Hamburg chickens; rare old violin. Elias Fox, Union Center, Wis.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled. Superior Honey Co., Ogden, Utah.

WANTED

ATWATER HONEY—Supply your customers.

WANTED—Old combs, cappings or slum gum, for rendering by steam press process. We pay cash for wax rendered, trade for supplies, or work it into foundation.

W. T. Falconer Mfg. Co., Falconer, N. Y.

WANTED—To get in touch with beekeeper having pure sourwood honey.

S. D. McAuley Rt. 8, Waterloo, Iowa.

WANTED, TO LEASE—150 to 200 colonies of bees. Would make contract for three or five years; good location. Will give references.

Robert Gunter,

750 N. Third St., Lawrence, Kans.

WANTED—Bees in Langstroth 10-frame or Modified Dadant hives; prefer near eastern Kansas. Phillip A. Readie,

1420 Ohio St., Lawrence, Kans.

WANTED—White clover extracted honey; send sample; state how put up, and price wanted. A. F. Lewis, Le Roy, Minn.

Wanted—First editions of the noted books on bees.

Mrs. M. J. Fox,

Foxden, Peekskill, N. Y.

WANTED—Honey, section, bulk comb and extracted. W. A. Hunter, Terre Haute, Ind.

WE BUY honey and beeswax. Give us your best price, delivered in New York. On comb honey, state quantity, quality, size and weight of sections and number of sections to a case. Extracted honey, quantity, quality, how packed, and send samples.

Charles Israel Bros. Co.,

486-490 Canal St., New York City.

WANTED—Beeswax, also old combs and cappings to render on shares; will buy your share and pay the highest market price.

F. J. Rettig, Wabash, Ind.

WANTED—Beeswax, old combs and cappings for rendering on shares. Also wax accepted for trade. Top market prices offered.

A. I. Root Co., Council Bluffs, Iowa.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices. Superior Honey Co., Ogden, Utah.

WANTED—Extracted honey. Send prices and samples. Will exchange Haywood vulcanizing outfit for honey, worth \$450, with tools and equipment. Chris Bahr, Cathay, N. Dak.

SITUATIONS

ATWATER HONEY—Supply your customers.

WANTED—Housekeeping by competent widow with one son aged 10 years. Address, Grace Larkey, Owatonna, Minn., Park Ave.

WANTED—A man who thoroughly understands the care of bees; a good job for the right party. References required. Address

R. T. Parker,

69 Appleton Ave., Pittsfield, Mass.

MISCELLANEOUS

ATWATER HONEY—Supply your customers.

FOR SALE—40 acres cut-over land, with new house, cottage, barn, chicken house, on Maiden Lake resort. Would make good bee location. No bees. For further information write to the owner.

Wolf-Kernen,

Lakewood, Wis.

GRANULATED HONEY SLIPS—Small and neat. They save complaints. Thousands are being sold; 100, 20 cents; 500, 80 cents; 1,000, \$1.50. Dr. Bonney, Buck Grove, Iowa.

LEAGUE EMBLEMS—We still have a number of U. S. Beekeepers' emblems, buttons or pins, bronze or gold. Send 50 cents and get one.

American Bee Journal, Hamilton, Ill.



Southern Headquarters Package Bees. Reliable Queens. Three-Banded Italian Only

We solicit your orders for 1922 shipping. We have the stock, equipment and experience necessary to give you prompt, satisfactory service. We have more than 1,000 big, healthy, hustling colonies of pure Italian bees to draw from. Write for our illustrated price list.

W. D. ACHORD, Fitzpatrick, Ala.

ANOTHER NEW BOOK

BEEKEEPING IN THE SOUTH

BY KENNETH HAWKINS

There is a great demand for a book giving detailed information relating to beekeeping conditions in the South. Kenneth Hawkins, as a beekeeping specialist for the United States Department of Agriculture, visited all of the Southern States and has made a special study of the characteristics of this region. This is not a textbook of beekeeping, but rather a book of information about a great region where beekeeping offers exceptional possibilities and where there is a great variation of the climate and flora of different sections. Illustrated with many photographs. Mailing weight 1 pound. Price \$1.25.

AMERICAN BEE JOURNAL, Hamilton, Illinois

GOLDEN QUEENS 1921

Golden and three-band queens, untested \$1 each, or 6 for \$5; \$80 per 100. Virgin queens 50c each, or \$40 per 100. All orders will be filled promptly, or parties notified just when to look for them. Reasonable satisfaction to everybody.

R. O. COX, Rt. No. 4, Luverne, Ala.

SHE-SUITS-ME queen-bees, prices for 1921: Untested Italians, \$2 each; \$1.75 each for 10 or more, prior to June 15. After June 15, 1 to 9 queens \$1.50 each, 10 to 24 \$1.40 each, 25 and up \$1.25 each.

ALLEN LATHAM,
Norwichtown, Conn.

WESTERN BEEKEEPERS!

We handle the finest line of bee supplies. Send for our 68-page catalog. Our prices will interest you.

The Colorado Honey Producers' Association, 1424 Market St., Denver, Colo.

Printing

Honey Labels
Stationery
Cards, Tags,
Etc.

Everything for
the Beekeeper

Order Early and get Prompt
Service

New labels, new equipment, more help. We are better equipped than ever to supply all kinds of printing for the beekeeper

**American Bee
Journal**

HAMILTON, ILL.

FOR YOUR 1921 CROP

Comb honey shipping cases, honey cans, friction top pails. Prices on application.

Early order cash discount on sections, hives, supers, frames, comb foundation and other goods.

Buy now and get supplies ready for 1922. Make out your list and send for our prices.

AUGUST LOTZ COMPANY, Boyd, Wisconsin

IT'S HERE!

WE HAVE IT!

QUALITY BEE SUPPLIES

POLISHED SHIPPING CASES

One-piece covers and bottoms, glass and paper included, selling at cost prices, as follows:

24-lb., for 1½ sections, -----	\$30 per 100
12-lb., for 1½ sections -----	\$17 per 100

Write for illustrated catalog on our bee supplies.

We are always ready to serve you.

CHAS. MONDENG

146 Newton Ave. N. and 159 Cedar Lake Rd. Minneapolis, Minn.

Nuclei For Sale—1922 Prices

Book early to get the best shipping dates. Experience has taught us that the three-frame nuclei is the right size to build up for the clover flows of the North, providing you get them by May 15. I make a specialty of the three-frame size, having shipped over 1,200 with only a loss of 6 last season.

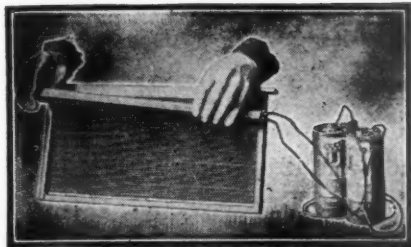
Note what one of the largest beekeepers in the North says: "I have no hesitation in recommending you as to ability to put up bees for shipment, or as to your business integrity. Of the 225 nuclei sent to date, every one came through alive and in fine condition." (Name on request.) Although we sold our nuclei at really pre-war prices last season, I am still making a further reduction.

Price List of Our Goods

3-frame nuclei hybrid bees, guaranteed pure Italian queen, \$5.00 each	
3-frame nuclei Italian bees, with Italian queen -----	6.00 each
3-frame nuclei black bees and black queen -----	4.00 each
Cypress hives, complete, crate of 5 -----	\$13.00
Medium brood foundation, per lb. -----	.68

I am always buying and establishing new yards, is the reason I can sell the black bees with success. Perfect satisfaction guaranteed. Terms one-third down to guarantee acceptance.

A. R. IRISH, Ludowici, Ga.



ELECTRIC IMBEDDER

Price without Batteries, \$1.50
Not Postpaid.

Actually cements wires in the foundation. Will work with dry cells or with city current in connection with transformer. Best device of its kind on the market.

For sale by all supply dealers.

Dadant & Sons, Manufacturers
HAMILTON, ILL.

CHESHIRE'S "BEES AND BEEKEEPING," in two volumes, has recently been reprinted. We offer it to our subscribers at \$6 for the two volumes, postpaid.

AMERICAN BEE JOURNAL, Hamilton, Ill.

QUEENS

Write for our catalog of high grade Italian Queens. Pure mating and safe arrival guaranteed.



1 to 4 inclusive, \$2 each.

5 to 9 inclusive, \$1.95 each.

10 or more, \$1.90 each.

Breeders, \$12.00 each.

JAY SMITH, Route 3
VINCENNES, IND.

1922

Place your order now for 1922 delivery of

FOREHAND'S THREE-BANDS
The Thrifty Kind

They are surpassed by none, but superior to many.

Package Bees. Three-band Queens

Write for prices now.

W. J. FOREHAND & SONS
Fort Deposit, Ala.

MONEY SAVED

*Why haven't
you clipped
this coupon?*

IS MONEY MADE

THAT IS WHY YOU
WILL WANT TO SEND
US THIS COUPON AT
ONCE. WE HAVE
SOME MONEY SAVING
PRICES FOR YOU

The A. I. Root Co. of Iowa, Council Bluffs, Iowa

GENTLEMEN: Kindly name your special fall prices on

- ☐ Eight frame hives, metal cover, complete
- ☐ Eight frame bodies, with frames, complete
- ☐ Shipping cases in lots of _____
- ☐ Cans, jars and pails, also second hand 5 gal. cans
- ☐ Honey tanks

☐ As I am anxious to make the most of my honey production, please send me your service bulletin "Bee Topics." I am interested in your September's issue treating principally with market conditions, and your suggestions as to increasing sales. I have _____ colonies

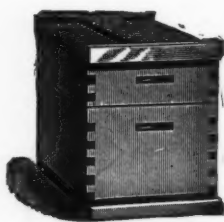
_____ frame hives. For your further information I wish to state that

Name _____

Address _____

THE A. I. ROOT CO. OF IOWA

COUNCIL BLUFFS, IOWA



MR. BEEKEEPER—

We have a large plant especially equipped to manufacture the supplies that you use. We guarantee all materials and workmanship. We ship anywhere. We allow early order discounts and make prompt shipments. *Write for free illustrated catalog today*

LEAHY MFG. CO., 90 Sixth Street, Higginsville, Missouri

J. W. ROUSE, Mexico, Missouri

A. M. HUNT, Goldthwaite, Texas

TENNESSEE-BRED QUEENS

Forty-nine Years' Experience in Queen-Rearing
Breed Three-Band Italians Only

	Nov. 1st to June 1st			June 1st to Nov. 1st		
	1	6	12	1	6	12
Untested Queens	\$2.00	\$ 9.00	\$16.80	\$1.50	\$ 8.00	\$14.50
Select Untested	2 25	10.50	18.00	2.00	9.50	16.00
Tested	3.50	20.00	35.00	2.50	13.00	25.00
Select Tested	4 00	22.50	40.00	3.00	16.00	30.00

Select tested, for breeding \$7.50

- The very best queen tested for breeding \$15

Capacity of yard 6000. I sell no bees by the pound or nuclei except with high priced tested and breeding queens

Queens for export will be carefully packed in long distance cages, but safe delivery is not guaranteed

JOHN M. DAVIS, Spring Hill, Tenn.

Five colonies of your stock produced 2660 finished sections—the best one 616 finished sections
JOHN M. BIXLER, Corning, Iowa, February 1, 1921

MAKE YOUR BEES PAY

If you want bigger honey profits, *get the best queens you can buy.* This is the secret of successful bee raisers. Hundreds of America's greatest honey producers order Forehand's 3-banded Italian Queens. Follow their example. Order from Forehand and be sure of satisfactory results. Backed by 28 years' successful experience in queen breeding and honey production. Take no chances. Experimenting is costly. So certain am I that my queens will satisfy you that I will gladly replace unsatisfactory queens delivered in the United States or Canada, or refund your money. You be the judge and jury. Can anything be fairer?

PRICES—Aug. 1 to Nov. 1.

	1	6	12
Untested	\$1.00		\$10.00
Select untested	1.25		12.00
Tested	2.50	\$13.00	24.00
Select tested	3.00	16.50	30.00
Bees in 2-lb. packages—1 package, \$6; 25 or over, \$5.80; 50 or over, \$5.40; 100 or over, \$5; without queens.			

Place your order *now.* Prices low, quality considered. Write for circular and discounts on large orders.

N. FOREHAND
RAMER, ALA.

Breeder of 3-banded Italian Queens exclusively

BEE SUPPLIES

We carry a complete stock of supplies at all times, and can make prompt shipments. Our prices will interest you.

Send Us Your Inquiries

A. H. RUSCH & SON CO.

Reedsville, Wis.



Shrubs and Trees

That provide Nectar for the Bees and Fruit for the household. No Cash with order. Get our Catalog TODAY.

PROGRESS NURSERIES
1318 Peters Ave. Troy, Ohio

Annual White Sweet Clover Seed

(James or Alabama Strain)

Start right. Buy your seed from the home of this New Plant.

This clover was discovered growing in Alabama by our Mr. James, in 1919.

Our crop this year was harvested without rain, and we can furnish a very high grade of seed, absolutely pure, grown by us on cultivated lands.

We are offering a limited supply at \$2 per pound, delivered. This will be clean, hulled, scarified seed. Germination test must please you. Write for further information as to how to grow, etc.

F. A. James Clover Seed Co.

Newbern, Alabama

QUEENS OF MOORE'S STRAIN OF ITALIANS

Produce Workers

That fill the supers quick
With honey nice and thick

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc.

Untested queens, \$1.50; 6, \$8; 12, \$15.

Select untested, \$2; 6, \$10; 12, \$19

Safe arrival and satisfaction guaranteed.
Circular free.

I am now filling orders by return mail.

J. P. MOORE, Queen Breeder
Route 1 Morgan, Ky.



HONEY FINEST Michigan Raspberry
Clover comb and extracted honey.

Crate 8 cases 24 sec. Ex. Fancy \$40.00
Crate 8 cases 24 sec. Fancy comb 36.00
Crate 8 cases 24 sec. A No. 1 co'b 32.00
Crate 12 pails, 5-lb., extracted 9.60
Crate 6 pails, 10-lb., extracted 9.00
Crate 2 cans, 120-lb., extracted 12.00

Send Today for Free Sample

W. A. LATSHAW COMPANY, Clarion, Michigan.

13,019 ITALIAN QUEENS

Reared and sold to September first this season.

Untested, 1 to 12, -----\$1.00 Untested, 12 or more -----\$.75

For Sale—Several complete outfits, consisting of any number of colonies desired, with either comb or extracted honey equipment, which can be easily moved to Hubam Clover Section.

4,000 nuclei or 4,000 packages. Let us book your order now.

Sweet Clover Seed, \$2.50 per bushel. Sow a bushel around each apiary. It will pay.

CYPRESS BEE SUPPLIES

THE STOVER APIARIES, MAYHEW, MISSISSIPPI

We Wish to Thank Our Customers for Their Patronage and Patience During the Past Few Months

Our advertisement, August issue, page 301, brought thousands of orders. We were completely swamped. Over 6,000 queens shipped since August 1st. Increased our yards fourfold.

NOW BOOKING ORDERS 1922 SPRING DELIVERY. WRITE FOR SPECIAL PRICES, NUCLEI PACKAGES AND QUEENS

Terms: 25 per cent deposit to book order.

BEEKEEPERS' SUPPLIES

Distributors of "Root Quality" Bee Supplies. Lowest prices. Factory shipment to save you freight. Write for catalog and quotations.

THE SOUTHLAND APIARIES, Box 585, Hattiesburg, Miss.

HONEY CANS

Several carloads just received at our Ogden, Utah and Idaho Falls, Idaho warehouses

We also manufacture shipping cases and dovetailed beehives. Special prices on request. "Everything in bee supplies." Prompt shipments

SUPERIOR HONEY CO., Ogden, Utah

(Manufacturers of Weed Process Foundation)

HONEY

WANTED

HONEY

We are in the market for both comb and extracted. Send sample of extracted, state how put up with lowest price delivered Cincinnati. Comb honey, state grade and how packed with lowest price delivered Cincinnati. We are always in the market for white honey if price is right.

C. H. W. WEBER & CO., 2163-65-67 Central Ave., Cincinnati, O.

QUEENS**PACKAGE BEES****FULL COLONIES AND NUCLEI****QUEENS**

Our bees are hustlers for honey, prolific, gentle, very resistant to European foulbrood, our customers tell us. For years we have been shipping thousands of queens and pounds of bees all over the United States and Canada. We are continually getting letters with statements such as the following: "Well pleased with your stock; best we ever had. The bees we got from you are the tops (best) out of our 225 colonies; bees arrived in fine shape; well pleased." One customer in Canada wrote he would get over 200 pounds average this year from bees bought of me last year; another wrote he would get over 90 pounds average this year from packages bought in the spring. Write for free circular giving details, etc.

We are quoting a lower price for balance of the year, but will still hold up the high standard of Quality First. I have a good proposition for two or three Northern men wanting to come South this fall. Write for particulars.

Queens after July 1st, balance of the year:

Untested	\$1.85 each, 25 or more \$1.00 each	1 pound pkg. bees,	\$2.25 each; 25 or more, \$2.13 each
Select Untested	\$1.50 each, 25 or more \$1.25 each	2 pound package bees	\$3.75 each; 25 or more, \$3.56 each
Tested	\$2.25 each, 25 or more \$1.75 each	3 pound pkg. bees,	\$5.25 each; 25 or more, \$4.98 each
Select Tested	\$2.75 each, 25 or more \$2.00 each	Add price of queen wanted when ordering bees. Safe arrival	
Breeders	\$5.00 to \$15.00	guaranteed within 6 days of here.	

MY FREE CIRCULAR FOR 1922 SHIPPING, quoting lower prices on package bees and queens is ready to mail. Send for one before placing your order.

NUECES COUNTY APIARIES, Calallen, Texas**E. B. AULT, Proprietor****SLUM GUM AND OLD COMBS**

Worked into beeswax at 5c per pound, minimum charge \$1.00. Pay taken from wax.

Market price paid for the wax, worked into foundation or trade for supplies.

Working beeswax into foundation is a specialty with us.

Ship to Falconer, N. Y. Mark each package with your name and address both inside and outside.

Write for red catalog of beekeepers supplies and REDUCED price list.

W. T. FALCONER MFG. COMPANY, Falconer, N. Y., U. S. A.*"Where the good Beehives come from"***GOLDEN ITALIAN QUEENS**

	Nov. 1 to June 1			June 1 to Nov. 1		
	1	6	12	1	6	12
Untested	\$2.00	\$ 9.00	\$16.80	\$1.50	\$ 8.00	\$14.50
Select Untested	2.25	10.50	18.00	2.00	9.50	16.00
Tested	4.00	22.50	40.00	3.50	10.50	36.00
Select Tested	4.50	25.00	45.00	4.00	22.50	40.00

BREEDERS \$12.50 TO \$25.00

10 per cent additional for Exported Queens. Queens for Export will be carefully packed in long distance cages, but safe delivery is not guaranteed.

NO NUCLEI, FULL COLONIES OR POUND PACKAGES.

BEN G. DAVIS, Spring Hill, Tenn.**BARNES' FOOTPOWER MACHINERY**

Read what J. E. Parent, of Chariton, N. Y. says:

"We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work."



W. F. & JOHN BARNES
95 Ruby St., ROCKFORD, ILLINOIS

Crop and Market Report

Compiled by M. G. Dadant

THE CROP COMPARED TO LAST YEAR

In very few localities do the beekeepers report as large a crop of honey as last year, and this in view of the fact that 1920 was not a bumper crop year.

New England reports are far from flattering, ranging from 50 per cent of a crop to no crop at all. In New York the crop has been very spotted. We believe, however, that the amount of honey will rank well up to what it was a year ago. The Pennsylvania crop seems to be better than a year ago. New Jersey has a small crop, as have the Virginias.

The Carolinas are very short. One of the largest producers in that section reports only 10 per cent as much honey as last season. Georgia reports are conflicting, but the average would indicate that the crop was some better than a year ago, while in Florida the opposite is true, there being not more than 50 to 75 per cent of 1920.

Kentucky has a fair crop. Tennessee has little honey in the western half, with more in the eastern. Mississippi is better than in 1920, since there was a very short crop in 1920. Alabama the same. Louisiana has had a good crop, probably much in excess of 1920. In fact some beekeepers report that they have never seen honey come in so freely.

Texas started off poorly, but has recuperated her losses, only to be struck by drought in many sections as cotton was blooming. All in all, the crop will range nearly up to last season, with the best reports from the sections within 100 to 150 miles of San Antonio.

Ohio is one of the States showing the largest crop, with 25 per cent more than a year ago. Eastern and northern Indiana are almost as good. Illinois is short everywhere, as she was a year ago.

Michigan has had a good white honey crop in the southern half. Fortunately, the fall flow has materialized as never before, especially in northern Michigan, with the result that the total crop will likely reach normal.

Wisconsin will have very little honey comparatively, and most Minnesota locations do not expect more than 50 per cent of 1920.

Western and Northern Iowa are good, about 80 per cent of normal, while southern and eastern Iowa are very short. Missouri will have nearly half of 1920. South Dakota is nearly normal, but Nebraska is very short except in the Platte Valley. Kansas will be about half of 1920.

Montana is coming up to last year, thanks to the late prolonged flow. Colorado had a failure last year. The crop will not be large, but it will outrank 1920 considerably.

New Mexico and Arizona have both had near to a failure, possibly half as much honey as last year will be harvested. Idaho is also short, with less than 50 per cent of last year's crop, which was very large. Washington is about the same as Idaho.

The crop is spotted in both Nevada and Utah, but the large yield of some districts will make up for the shortcomings in others, making the total normal.

If Oregon had not been hampered by excessive losses this year through poison sprays, the crop would have been excellent. As it is, it will be 50 to 75 per cent of a year ago.

Northern California is nearly normal, but many complaints are coming from Southern California of a very short crop, some estimating it at 10 per cent of last season.

PER COLONY AVERAGES

Ohio, Indiana, Georgia, South Dakota, Montana, California, Louisiana and Mississippi have reporters who have secured an average of 100 pounds per colony, but

these are very much scattered, and are scarce. There are less reports "big crop" than for many years.

New Jersey, North Carolina, and many in California and other short States, will have to be contented with an average of 10 to 20 pounds per colony.

PERCENTAGE OF CROP SOLD

Only a small percentage of the present honey crop has been disposed of, but in most localities it is moving at a good rate for this time of year. Texas, as usual, is selling earlier than the other States. States of small production report no difficulty in selling out early in the season.

PRICES WHOLESALE AND RETAIL

Prices are at wide variance in different States, and even in the same localities. They seem to depend more upon the attitude of the producer than on the value of the product or the demand on the part of the public. For this reason there are some offering honey in 5-pound pails as low as 65 cents, and in 10-pound pails at \$1.25. The bulk of the beekeepers, however, seem to have taken it for granted that honey would sell in a jobbing way for about 10 cents per pound, and are offering 5-pound pails at from 90 cents to \$1.25 and 10-pound at from \$1.90 to \$2.40.

In a jobbing way, the amber honies seem to be suffering the most as to price, evidently due to the competition of foreign shipments. Some report sales of amber alfalfa and of Southern honies as low as 5½ to 6½ cents, with one or two sales even lower. A few cars of white honey moved at as low a price as 7 cents f. o. b. shipping point, but most is selling now at from 8 cents to 9 cents f. o. b. shipping point in the western territory, with a correspondingly higher price east.

PRICES ASKED

More and more there is a tendency to hold honey rather than sell at a figure which the beekeeper feels is too low, and to make an extra effort at local sales if necessary.

It is doubtful, after the first flurry of the stampeded producer is over, whether any white honey will find its way into the markets at a less figure than 10 cents f. o. b. intermountain, which would mean nearly 2 cents more in eastern territory.

Amber honey will continue to suffer more than white. Yet a recent reported shipment of 20 carloads of West Indian honey to Germany goes to show that our markets have reached their lowest ebb and that honey will go abroad rather than be sacrificed as it has been the past spring and summer.

All indications are that the honey market is improving, and this is being borne out by the activity of buyers, who have up till recently been inclined to hold off, looking for better bargains.

Sugar still remains at fairly low levels, being in the neighborhood of 6 cents jobbing.

There are two things which would tend to make for a stiffening of the honey market. The first is a woefully short crop of fruits, and the second is that many people during their two or three years of affluence have acquired a taste for the better sweets, such as maple syrup and honey, and will be slow to return to the corn syrups even though offered them at attractive prices.

All in all the honey outlook looks anything but pessimistic to me. Like most other farm products, it went to unprecedentedly low levels compared to its production cost; like them, it will gradually come back into its own. We cannot again look for the prices of two years ago. We should not. But the market should improve to the point where there is remuneration for the producer.

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Red "Eat Honey" in lower left hand corner 20% extra. Shipping weight 10 lbs. per 1000.

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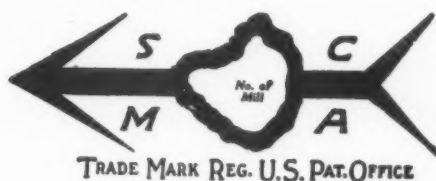
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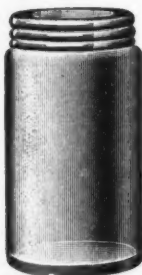
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Our 6½ oz. size tumbler is used extensively wherever a small package of honey is required. Tumblers have tin caps and waxed paper for making a tight seal. Packed complete in boxes or barrels at the following prices:

Cat. No.	Weight	Price
B442102—6½ oz. tumblers, 48 to case	20 lbs.	\$1.65
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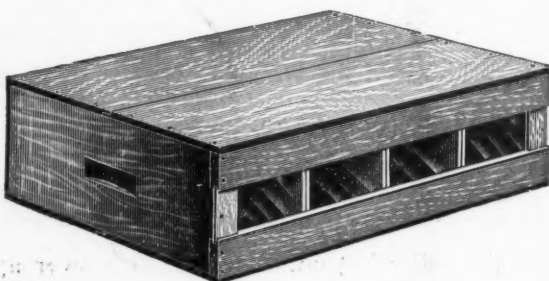
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For retailing honey in large packages direct to the consumer we know of nothing better than the friction top cans and pails.

Cat. No.	Size of Containers.	Weight.	Price.
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B442020	5 lb. can, box of 12	16 lbs.	1.45
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